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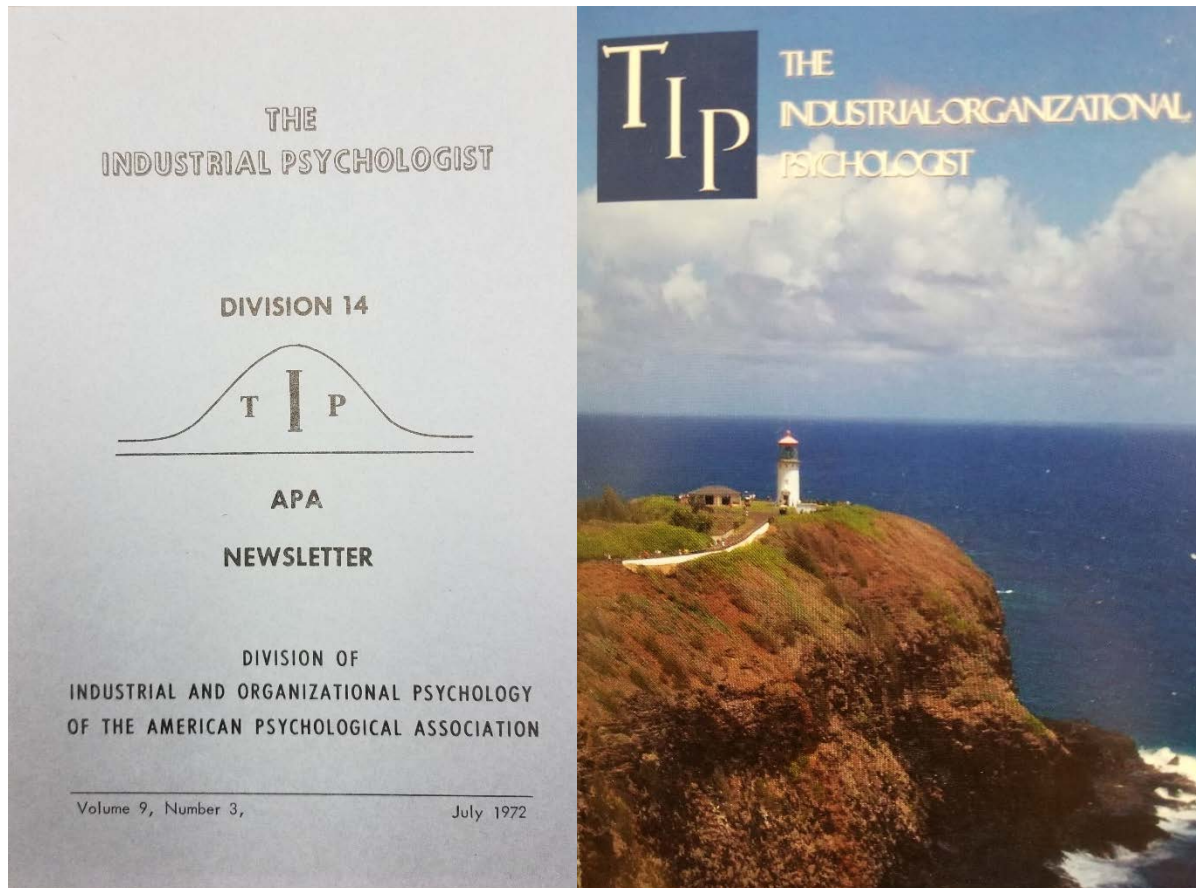
From the Editor

Tara S. Behrend

I've been thinking about change lately, prompted by an exciting email I received in January. **Shelly Zedeck** was wondering if I had any interest in his collection of old *TIP* issues. At first, I hesitated. I was only in California temporarily, so a logistics challenge presented itself. How would I transport these treasures from the West Coast to the East Coast? How many could I fit in my carry-on before resorting to shoving them in pockets or under my hat? After only a few minutes of deliberation, though, I decided the airline acrobatics were worth it. I couldn't pass up the chance to get my hands on this archive of SIOP history. In case you are wondering, by the way, I can fit exactly 12 issues of *TIP* into my laptop case. Only three can fit under a hat.

In reading through the archive, the first thing I learned is that SIOP history is heavy. And I mean physically heavy. I assume that all the collected wisdom adds pounds.

The second thing I learned is how very much *TIP* has changed since Issue 1. Each editor has put a personal touch on the publication, most immediately evident in their choice of cover design (see below). I confess that I was jealous that *TIP* no longer has a physical cover, and thus I have no outlet to inflict my terrible taste on all of you.



In these pages, I found deliberations about whether to change the name of the Society; reports of changes in US laws that affect our practice; celebrations of our best scientific minds; and throughout, a culture of respect and collaboration despite clear differences in opinions. Some things never change.

This issue of *TIP* is one I'm very excited about, and one I hope future readers will refer back to with interest. In the summer of 2016 when I took on this editor role, one of my goals was to launch an open, preregistered, and transparent project to generate rankings of I-O psychology graduate programs. Whether you love rankings or hate them, people use them, and so it's worth doing them in the best way possible. To me, that meant identifying measures of quality that previous rankings projects may have overlooked. A team, led by **Nick Salter**, put out a call for proposals, and five teams submitted proposed methodologies. A committee of experts reviewed the proposals, and data collection began in early 2017. I am delighted that the final reports from those teams are now available. You can find them in a special section of this issue. Each team used different indicators so it's not surprising that they came to different conclusions about the final rankings. The truth about graduate education is that different programs do different things well.

I want to thank the entire team who agreed to work on this project: **Allie Gabriel, Joe Allen, Dave Sowinski, Loren Naidoo**, and especially Nick Salter, who has led the entire project with enthusiasm and great insight. I encourage you, as readers, to reflect on whether you agree with these rating criteria or whether you could generate a different list. It is useful to remember that rankings of any kind make assumptions about what kind of work is valuable. Rankings also involve many "researcher degrees of freedom"—decisions by the rankers that may not be explicit in the final product. For example, if a faculty member switches programs, when should her publications be counted for program A versus Program B? No ranking list will be perfect, but this project gives us some different ways of thinking about excellence.

This issue also has lots of other terrific resources and information for being your best self as an I-O psychologist. For example: In their final installment of *Lost in Translation*, **Andrew Collmus** and **Mike Litano** offer an in-depth and extremely valuable look at how to communicate visually with data. I'm sad the series is ending (for now), but I'm very proud to be able to publish their terrific work, and I'm sure it will have long-lasting utility for the field.

This issue also bids farewell to the special series on the intersection between I-O and the field of Learning & Development, expertly led by **Amy DuVernet** and **Tom Whelan**. I encourage you all to spend some time with their column and think about what we can all learn about learning.

April marks a time of change for the SIOP Executive Board and committee chairs, too, which means you will see other new faces in upcoming *TIP* issues as the reins are passed. Please thank these folks when you see them at the conference—it is a lot of work, done for very little reward, just out of genuine care for the field of I-O psychology.

President's Message

Fred Oswald

This fourth and final President's Message is dedicated to two major issues that SIOP and the profession of I-O psychology squarely face today and in our future. Let me elaborate on them here and hope they stimulate our continued thinking, discussion, and strategic actions as a society.

The first issue pertains to very notable and noticeable changes in our profession and membership within SIOP. Although these changes have been documented in the recent past (e.g., see **Rob Silzer & Chad Parson**, *TIP*, July 2015), they need to be reassessed more broadly and more often. To focus on one important example that is already impacting our future: Current trends reveal rapid growth in the number of terminal master's I-O programs, along with the high volume of I-O psychologists coming out of them and working in an increasingly wider range of professional settings. Concurrent with this trend, or perhaps because of it, many PhD I-O programs are beginning to incorporate terminal master's programs, both on-campus and online. Ideally, terminal master's programs can provide important support for I-O psychology PhD programs of the future—and not simply because deans like money (although this cannot be denied). Terminal master's programs can serve as a stepping stone for undergraduates who attend the I-O PhD-granting university; they can connect practice to science more closely within PhD programs; they can increase the community and visibility of I-O psychology within the university; they can identify students who might transition a PhD program; and they can create and expand the ecosystem of local applied and research opportunities. However, this does not happen magically; it requires very strong institutional commitment to appropriate resources and incentives for their sustainability. Many PhD-granting institutions have resisted implementing terminal master's I-O programs for lack of these two major requirements.

All of this growth in I-O psychology training sounds good, on the face of it. At the very least, the growth is consistent with US labor-market data indicating the value and demand for I-O psychology in the workforce (e.g., see <https://www.bls.gov/oes/current/oes193032.htm#top>). In this context, our I-O psychology education and training efforts have become more essential than ever—and fortunately, you might remember that SIOP has recently updated its Education and Training (E&T) guidelines that inform the nature and quality of our I-O educational programs. If you haven't done so yet, check out SIOP's 2016 competency-driven guidelines for I-O master's and doctoral programs at <http://www.siop.org/ETguidelines.aspx> (with thanks to **Whitney Morgan**, **Joe Allen**, and the Education and Training Committee).

These SIOP E&T guidelines are intentionally flexible. All I-O psychology programs tend to cover “core” competencies (broad psychological training, statistical and research methods, ethical issues); however, greater flexibility is accommodated when covering substantive I-O topic areas (e.g., organizational development, groups and teams, performance appraisal/management, training). I-O programs thus reflect natural variation that capitalizes on faculty expertise at local institutions. They are quasi-experimental settings that could be examined more closely. Although SIOP already gathers information on I-O programs, more detailed tracking of the number, nature, quality, and timing of topics covered by I-O PhD and master's programs will allow our guidelines and programs to inform one another better over time.

SIOP is also tracking developments in I-O related fields (OB, LIR, organizational science), and it is clear we are improving in this direction as well. The newly established **Future Scanning Ad-Hoc Committee** (FSC; **Alexis Fink**, chair) has set up a cross-functional structure that connects to the External Affairs Officer (**Janet Barnes-Farrell**, Chair; **Madhura Chakrabarti**, FSC liaison), Membership Services Officer (**Mo**

Wang, Chair; **Evan Sinar**, FSC liaison), Instructional and Educational Officer (**Milt Hakel**, Chair; **Kurt Kraiger**, FSC liaison), and related SIOP committees to ensure that our radar is highly attuned to the educational and professional landscape relevant to I-O psychology.

The second issue deals with how we can better frame and communicate our activities as I-O psychologists to a range of others (e.g., managers, university administrators, granting agency program officers, high school students). This issue arose most recently in a lunch I had with Incoming SIOP President **Talya Bauer** and **Joel Quintela** (Quintela Group) to discuss the nature and future of our profession. We didn't solve the world's problems over lunch! Instead, Joel, Talya and I focused on one topic: the problem of how I-O psychologists, and I-O psychology, can be better recognized by organizational decision makers. We discussed how Team SIOP (my vision this year) was about framing our work in terms of problems and impact (Steve Kozlowski's presidential vision) so that people from all walks of life can understand how I-O psychology benefits the future of the workplace (Mort McPhail's presidential vision). Joel emphasized the need for not using \$20 GRE words in communicating that message. (How perspicacious of him!)

Talya and I relayed to Joel how SIOP is becoming much more problem focused and issue focused in its current advocacy and communications efforts to promote I-O psychology. SIOP understands why it is critical that we continue in this direction; for instance, we recently held a meeting involving SIOP members concerned with veterans affairs issues (**Nathan Ainspan** chairing a subcommittee within GREAT; coordinating with Jesse Poon and Bill Ruch at Lewis-Burke). This is one example out of many, where SIOP is becoming increasingly engaged in more problem- and issue-focused communication strategies. My presidential involvement has been in providing broad-based input and support to relevant SIOP Committees and the Administrative Office in communications-related tasks such as (a) revamping the content and format of the siop.org website (stay tuned); (b) reconsidering the content, format, timing, and audiences for SIOP messaging across multiple media; (c) advancing our science and practice advocacy efforts with Lewis-Burke; and (d) extending our white papers into other informational documents and materials to serve a variety of audiences.

Hopefully in this reinvigorated process of translating our work and connecting to others, SIOP will provide our constituencies an interesting, useful, and accessible entry into our "science for a smarter workplace"—and maybe we'll only spend \$40 worth of \$20 GRE words! Three notable translation efforts of this nature (and there are others) are already underway. First is the new Oxford Translational Science Series edited by former SIOP president and current Research and Science Officer, **Steve Kozlowski**, where I hope we will find shared practice innovations influencing the relevance of our research, at least as much as research stands to impact practice. Another translation effort comes in *The Bridge*, a series of excellent *TIP* columns dedicated to the science-practice interface (there is a *Bridge* article in this edition; with thanks to column editors **Mark Poteet** and **Linda Zudec**). The third form of translation is one that I participated in, a planned eight-part *TIP* series called *Lost in Translation* (by **Andrew Collmus** and **Michael Litano**). Check these out if you haven't, as they cover translational issues such as communicating the value of I-O psychology (October 2016), overcoming critics in applied research (January 2017), and how I-O should talk with policymakers and funding agencies (July 2017). There are related videos as well, on our SIOP YouTube channel.

This "translation movement" is something of a paradigm shift for SIOP. As I-O psychologists, we place great importance and even pride in the general phenomena and robust findings that come out of our work—as we should. We talk happily at the level of constructs and meta-analyses, and because of our sophisticated statistical training, we also thrill to the discussion of correlations, reliability coefficients, and structural equation models (currently my own heart is racing). However, employees, employers, and

organizations are problem focused, and they critically require specific examples. They may enjoy benefit from scientific generalities but in a way that is *not* general but rather in a way that might give them some form of particular advantage in the workplace.

Food for thought. We are always working together as Team SIOP, and so please continue to reach out to me (foswald@rice.edu) or to Incoming President Talya Bauer (cetb@pdx.edu) if you have any further ideas, questions, or expertise along these two fronts that I have covered here.

It has been an incredible privilege to serve you in all its forms: for example, supporting and working with such amazingly talented, knowledgeable, and dedicated SIOP members and the Administrative Office (too many of us to single out here); collaborating and taking on various forms of the complexities that I-O psychology faces (and will always face) as an evolving field of study and evolving profession; and harnessing and promoting our expertise, so that we have a seat at the table in taking on a wide array of issues important to society (e.g., ensuring healthy and productive employees and workplaces; developing and improving diversity and inclusion efforts; cultivating leaders, careers, and organizations...the list goes on, as you know).

SIOP keeps getting better because of **you**!

Lost in Translation: Visually Communicating Validity Evidence

Michael L. Litano,¹ Andrew B. Collmus,¹ & Don C. Zhang²
 Old Dominion University¹, Louisiana State University²

In our previous [column](#), we discussed the complexity and nuances of measuring unobservable psychological phenomena and the importance of verbally communicating the value of reliability and validity evidence to non-I-O psychologists. Our interviews with **Fred Oswald**, **Jeff Jolton**, and Don Zhang were insightful, impactful, and extremely well-received by the SIOP community. However, we also received some feedback from I-O psychology practitioners that emphasized how much more frequently they communicate in the forms of charts, figures, and PowerPoint decks than simply in conversation, making it difficult to apply the lessons learned from our last column to their current roles. In fact, it is common in the business world to have your PowerPoint decks “walk” around the organization after your presentation, meaning that you must create your presentation to be interpretable and easily understood even without talking points to accompany the slides.

The focus of the current column is just that: How does one effectively communicate validity evidence using only visualization? Despite the interesting and relevant topic, we must express how difficult it was for us to obtain visualizations that effectively represented validity evidence. We had several academics and practitioners volunteer contributions that either (a) we had difficulty understanding, (b) mirrored an output you might see in the *Journal of Applied Psychology* rather than a business meeting, or (c) weren't representative of validity evidence. For example, although some business audiences may generally be able to interpret a scatterplot (see Don Zhang's contribution below), we as a field can and should do a better job of taking a validity coefficient and presenting it such that the value can be grasped by anyone.

The goal of this column is to show how conducting rigorous research on the back end is important, but only so far as the evidence/results are effectively communicated to those who decide whether and how to act. We hope to demonstrate how one might effectively visualize validity evidence, including how one might visually present a rigorous analysis or complex model in such a way that non-I-O audiences can understand and appreciate its value. Like previous columns, our hope is that this shift in focus will provide anyone who finds themselves “lost in translation” with resources that not only helps the individual I-O psychologist, but also builds the awareness and use of I-O psychology in organizations. In the sections that follow, Don Zhang, Michael Litano, **AJ Thurston**, and **Daniel Hawthorne** each share some of the ways that they have effectively presented validity evidence.

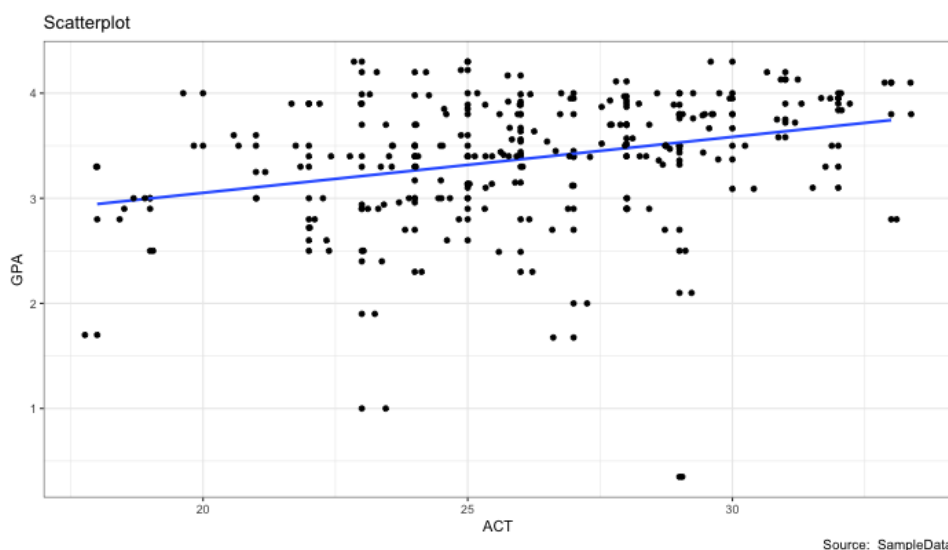
Don C. Zhang

In a recent conversation with a director of human resources, he (the director) lamented about the low prediction of most selection methods. “Only about 50%,” he said, referring to the meta-analytic validities reported in the seminal Schmidt and Hunter (1998) paper. Two problems: first, a correlation of 0.50 translates to 25%—*not* 50%—of variance explained; second, *only* 50%? As a field, we are not doing a good job of communicating the value of our work when our most treasured selection methods are received with an unimpressed “meh” by people in positions to use them.

Traditional validity indices such as the correlation and coefficient of determination do not convey the practical impact that a selection method has on organizations. *Percent of variance explained* is not the

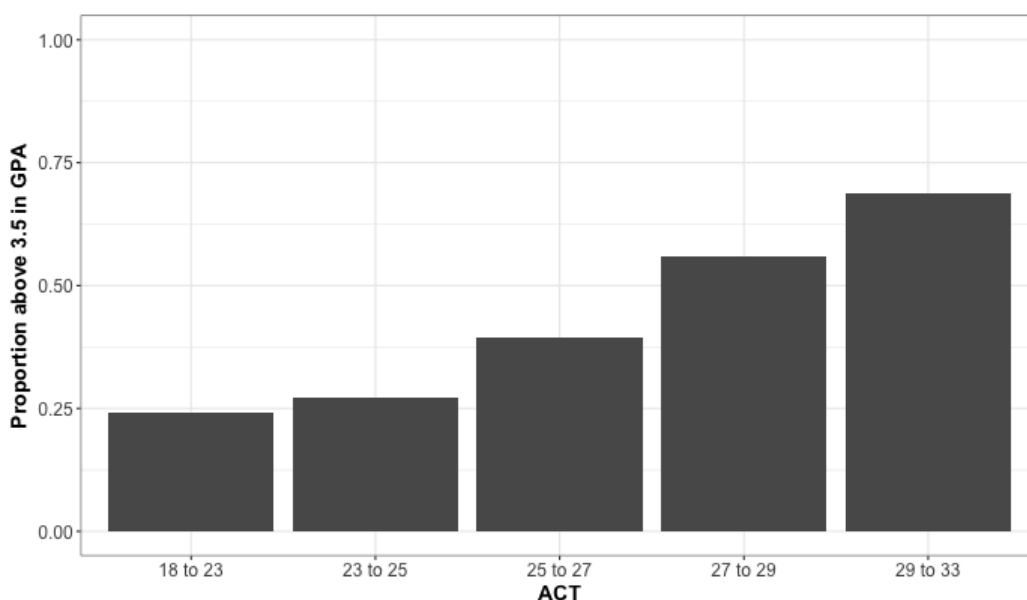
kind of metric business professionals care about, and 25% is not a number that will impress many. But, 25% is about as high as we can get due to the “validity ceiling” of predictions (Rundquist, 1969). Clearly, there is a need to communicate our evidence in a way that resonates with the public.

There are many alternative graphical and nongraphical displays of validity information (Kuncel & Rigdon, 2012). But, not all data visualization techniques are created equal. The scatter plot, for example, displays the relationship between a predictor and criterion variables on the X and Y axis. The plot below illustrates the relationship between ACT and college GPA, which has a validity of $r = .30$: not particularly impressive. At a glance, the relationship depicted in the scatter plot appears equally unconvincing. Yet, scatter plots are the primary method for visualizing linear relationships.



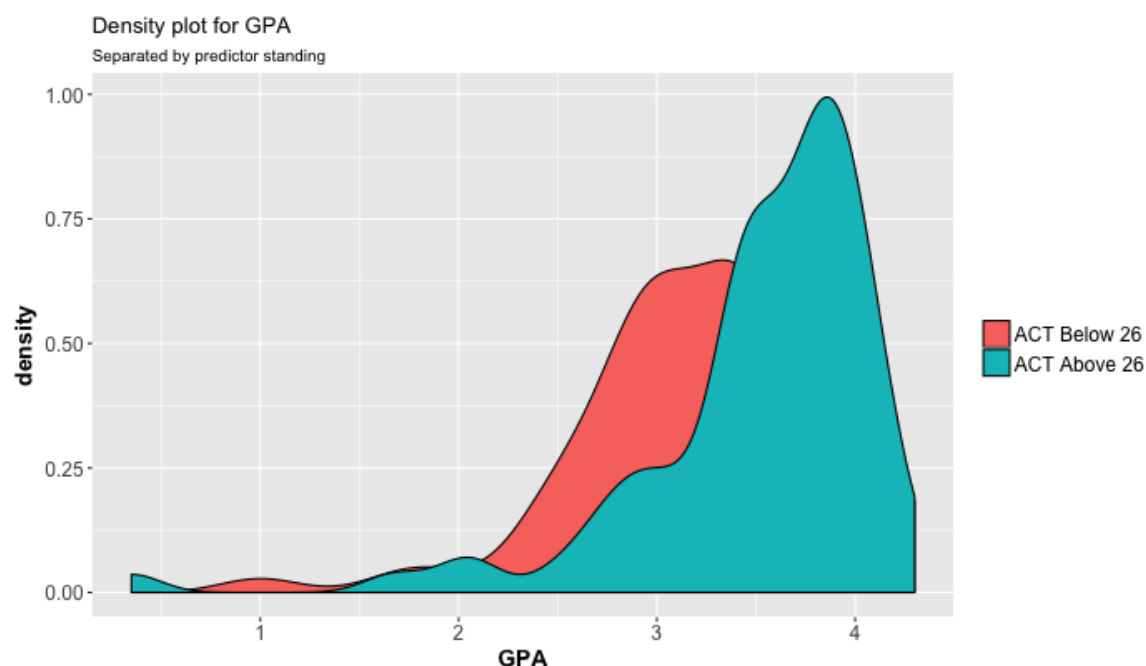
Alternatively, one can use an expectancy chart (Lawshe & Bolda 1958). Expectancy charts communicates the relationship between two variables (e.g., ACT score and GPA) by presenting the proportion of the sample with score above a cut-off criterion (e.g., GPA above 3.5) at a given score interval on the predictor

(e.g., ACT score between 25 to 27). Believe it or not, the expectancy chart below is generated with the same data as the scatter plot. Based on the expectancy chart, one can easily see the predictive efficiency of the ACT. Students in the top quintile of ACT have approximately 70% chance making the



Dean's List (GPA above 3.5) at most universities, whereas students in the bottom quintile of ACT have a less than 25% chance (25% takes on a whole new meaning in this context).

Sometimes decision makers are interested in dichotomizing the predictor. For example, an academic administrator might be concerned with choosing an appropriate ACT cut-off score for admitting students into the honors college. To visualize the distribution of GPAs between individuals above or below a cut-off, we can use an overlapping density plot. The figure below illustrates the distribution of GPAs for students with ACT scores above and below 26. One way to translate the results is with the Common Language Effect Size (CLES, McGraw & Wong, 1992). The CLES for the validity of the ACT can be described as, “a randomly chosen person with ACT greater than 26 has a 62% chance of obtaining a higher GPA than a random person with ACT less than 26.”



Nontraditional effect size indices and displays are particularly useful when communicating the practical value of selection tests. Research from my lab has found that the lay public tend to judge nontraditional displays as easier to understand than traditional validity statistics; and more importantly, they had much more favorable judgments about selection instruments (e.g., ACTs, structured interviews) when validity information was presented with nontraditional graphical displays.

Despite the benefits of these nontraditional displays of validity, there are—unfortunately—no accessible tools for generating these displays. Common statistical packages (e.g., SPSS) do not readily produce these alternative displays. In order to facilitate the calculation of nontraditional effect size displays, I’ve created a free-to-use web application that allows scholars and practitioners to easily generate and visualize a variety of nontraditional effect sizes such as expectancy charts, CLES, and binomial effect size displays with their own data (<https://dczhang.shinyapps.io/expectancyApp/>).

Michael L. Litano

Entering the applied world, I incorrectly assumed that senior leaders and other organizational decision makers would be able to understand and interpret analyses of “people” data that extended beyond simple descriptives, such as favorability scores and agree percentages (i.e., percent of employees who “agree” or “strongly agree” to a single or set of questions). That’s not to say these leaders didn’t care or

were incompetent, but because the way that validity evidence tends to be presented is too dense and unintuitive. If we assume the perspective of a senior leader with no I-O background and/or a limited understanding of statistics, what would we do with correlation coefficients, coefficients of determination, or (un)standardized parameter estimates?

I have conducted numerous interviews and focus groups with senior leaders and three themes generally emerge when it comes to digesting and interpreting survey results: they want (a) easily interpretable findings, (b) to see “trend”—how much scores have improved or declined since the last survey, and (c) what to focus on and how to drive meaningful change. As I-O psychologists, we are well-equipped to meet these needs, and I have found the best way to present this data is by doing my due diligence as a scientist in the background, then presenting findings that are easily interpretable even if it’s not the exact analysis that I conducted. After all, in people analytics, the goal is to use data-driven approaches to inform people and organization-related practices, programs, and processes, not to publish in a peer-review journal.

Here’s a scenario: Employee engagement is a high-value metric at Organization X. Employees are surveyed quarterly and each survey includes ten 3-item scales to measure constructs research suggests are primary antecedents of engagement (e.g., leader–employee relationship, professional development opportunities, etc.). Here’s one way I have analyzed such data in the background and then simplified the presentation of findings for a non-I-O audience.

Analysis: Every company has their own guidelines for presenting descriptive data (see translation section below), but when analyzing relationships between variables it’s still essential to methodically clean data, check assumptions, assess reliability of your measures, and demonstrate construct validity (correlations are fine with low N, but use confirmatory factor analysis with high N). At this point, we have some level of confidence that we are measuring distinct constructs that we are intending to measure. I don’t present any of these analyses to leaders outside of my team.

Because we have already identified employee engagement as the high-value metric of interest (let’s assume engagement is related to important HR and/or business outcomes), our goal is to be able to tell senior leaders with some degree of confidence *what* they should focus on to drive meaningful change. Especially when collected at one point in time, variables in organizational surveys generally share moderate-strong correlations with one another. Rather than rely on correlations (which do not provide accuracy metrics and consider only the focal relationship of interest) or multiple regression (which can provide misleading results when independent variables are highly correlated), I typically use relative importance analysis. This analysis treats independent variables as orthogonal so that you can more reliably assess the unique contributions of each. It easily identifies the most important “predictors” and sets us up well to translate.

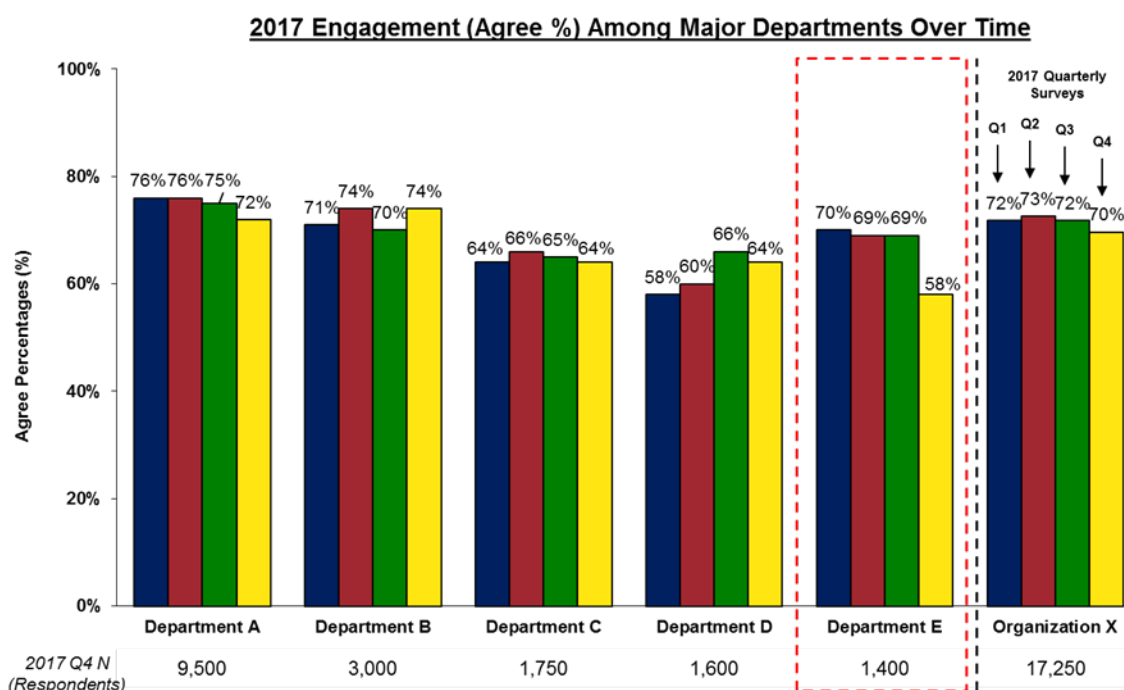
Note: Scott Tonidandel & James LeBreton developed free programs for calculating relative weights in multiple, multivariate or logistic regression: <http://relativeimportance.davidson.edu/>

Finally, it’s important to consider the magnitude of the findings you are sharing. For example, if I was only able to explain 2% variance in engagement, how much of an impact will these variables really have? Conversely, in large sample sizes, everything is statistically significant, so it is important examine the practical significance (direction and magnitude) of effect sizes. These and other considerations must be made as part of your duty as a scientist.

Translation: Considering what I told you leaders care about, I could present this analysis in two very easy-to-understand slides:

1. *They want easily interpretable findings.* Raw mean scores and standard deviations aren't meaningful to most people, so there is a data transformation aspect involved with this step. Each organization has a "preferred" way of communicating results, so you can be more effective if you can cater to their norms. In Organization X, managers are used to seeing "agree percentages." Therefore, I re-code each individual survey response variable to be binary (1 = *agree* or *strongly agree* on 5-point scale).
2. *They like to see "trend."* This isn't validity evidence, nor is it something we often care about as I-O psychologists. But again, if you can take the leader's perspective, it's logical to wonder, "how were my scores this survey?", "how do my scores compare to the organization?", and "how do my scores compare to my historical scores?" Generally, Slide 1 answers these questions for the senior leader and prepares him/her for our "validity story":

After remaining relatively stable in Q1 - Q3, Department E engagement fell 11 pts in Q4 and is 10 pts lower than overall engagement at Organization X

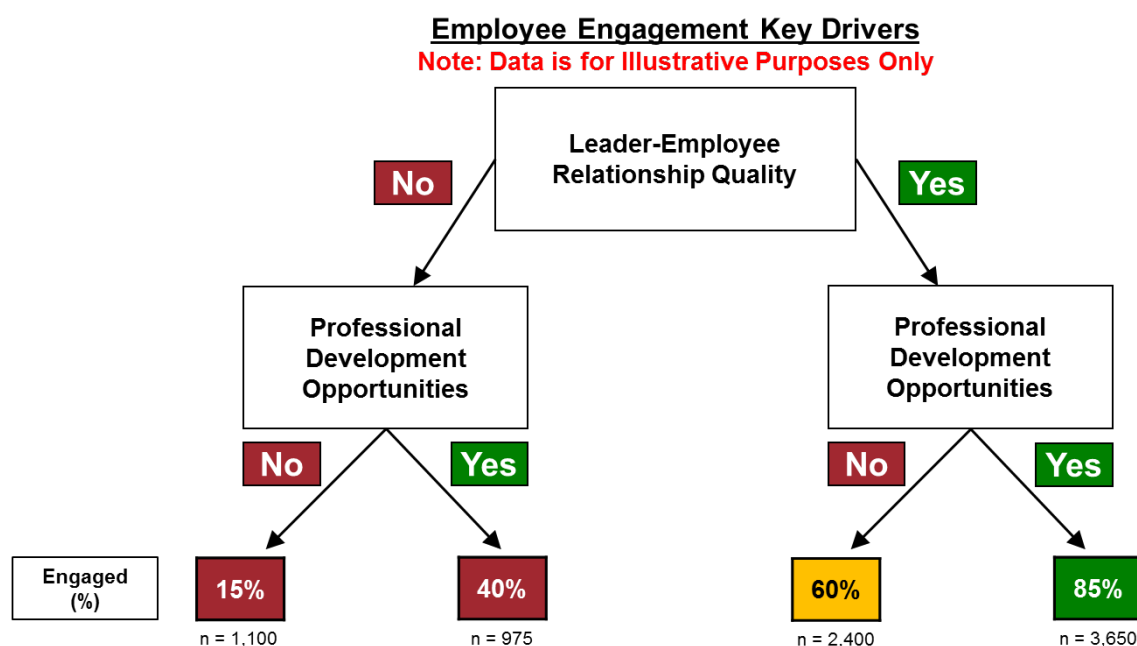


3. *They want to know what to focus on and how to drive change.* Here, we take the general results of our relative importance analysis and translate it for senior leaders. In this analysis, assume we've identified two variables to have the strongest relationships with employee engagement: leader-employee relationship quality and professional development opportunities.

Even when I am not conducting a random forests or other tree-based analyses, presenting this in a decision tree has been one of the more effective ways to communicate this finding to demonstrate what employee engagement scores look like in instances where these two variables are rated favorably and

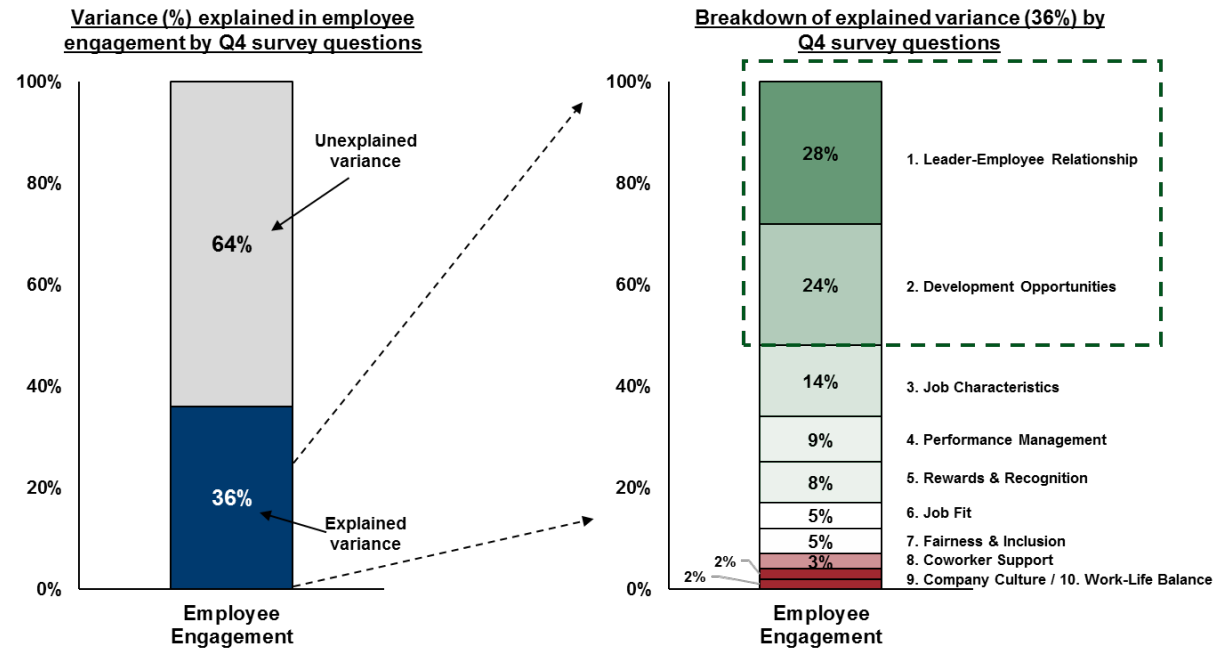
unfavorably. There are a lot of rules that you—as an analyst, team, and company—have to decide upon (e.g., how many tree branches to present, what are the cut-offs for “yes” and “no” decisions, etc.). Once those rules are determined, you can use your stats program of preference to codify each of the four decision tree buckets (high-high, low-low, high-low, low-high) and create a pivot table that generates unique engagement scores for each. I always present these in a footnote so that even when the deck “walks,” questions about the analysis can be answered.

As you can see in the chart below, it’s easy to see the percentage of associates who are engaged in each of the four scenarios. Again, I’m trying to communicate that these are the two things senior leaders should act on—not publish in an academic journal—so I decided to cut the branches off at two layers and codify predictors into binary agree scores so that the “yes” and “no” decisions are more easily interpretable (i.e., “yes” means an associate “agrees” or “strongly agrees” on average to that set of questions). Slide 2 highlights that 85% of employees that have high-quality relationships with their leaders and have their professional development needs met are engaged, compared to only 15% who have neither.



85% of employees that have high-quality relationships with their manager and are provided development opportunities are engaged compared to 15% that have neither

For those senior leaders who are more statistically and analytically proficient, you can also try to present the results of a relative importance analysis like the below:



Q4 questions account for 36% variance in engagement; leader-employee relationship & development opportunities account for over half of the unique variance

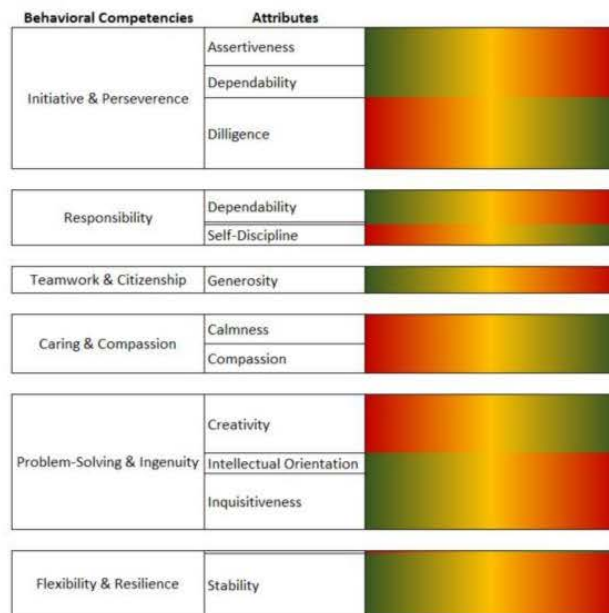
Daniel R. Hawthorne

When using this data visualization method, it is important to explain different ways that this shows the importance of each variable to the job(s) in question. Green shows the direction of the desired scores and the row-height indicates the strength of the influence. A lay person can rapidly look down the scores and see what the most important attributes are to a particular job.

After a lay person understands how the data is visualized, I can use this to get feedback about our data-driven regression equations and know if I need to consider adjusting weights based on attributes important to the client that we may not have picked up in data collection. We can also use this method to have new clients give feedback about transportable solutions and how they might fit with their jobs and, ultimately, how they might need to be adjusted to account for organizational differences between clients.

Additionally, if we've conducted a concurrent validation solution, this data visualization method can be used to adjust for an organizational change, where an organization wants to select for different employees than they currently have. For example, incumbent employees might show a strong association with problem solving and ingenuity, and a client might want to shift more to a model where caring and compassion attributes are the strongest weighted predictors. This method of data-visualization would show the existing employees' current organizational profile and make it easy to have a conversation with the client about how new employees might be selected to push the organization toward a new organizational competency model in line with the organizational change.

Job #1

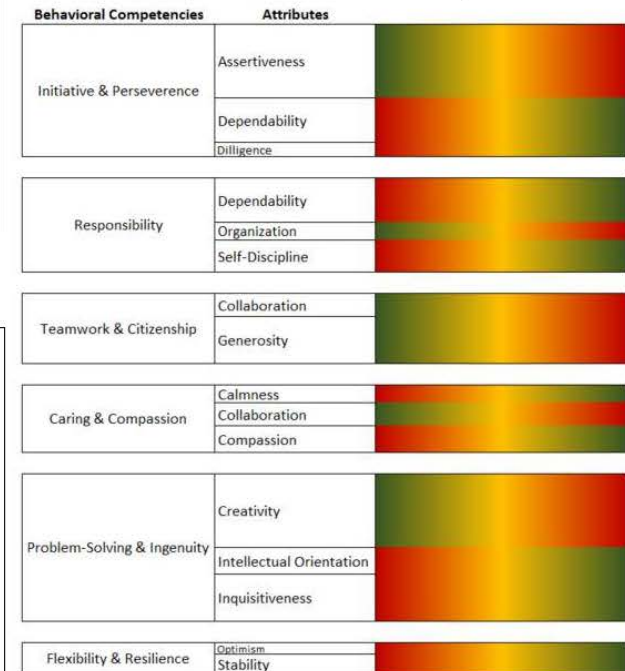
**Data Visualization Legend**

- Behavioral Competencies are made up of lower-level personality attributes
- Row-Height for each Attribute was calculated from Regression Weights; So, taller rows are stronger weights
- Color indicates the direction of Regression weights
 - Red indicates where poorer scores for the job would be
 - Green indicates where better scores for the job would be

Thus, this data visualization example gives a lot of information in a compact space. Even without any knowledge of the two jobs, one can glean a lot of information about the similarities and differences of each job's personality requirements.

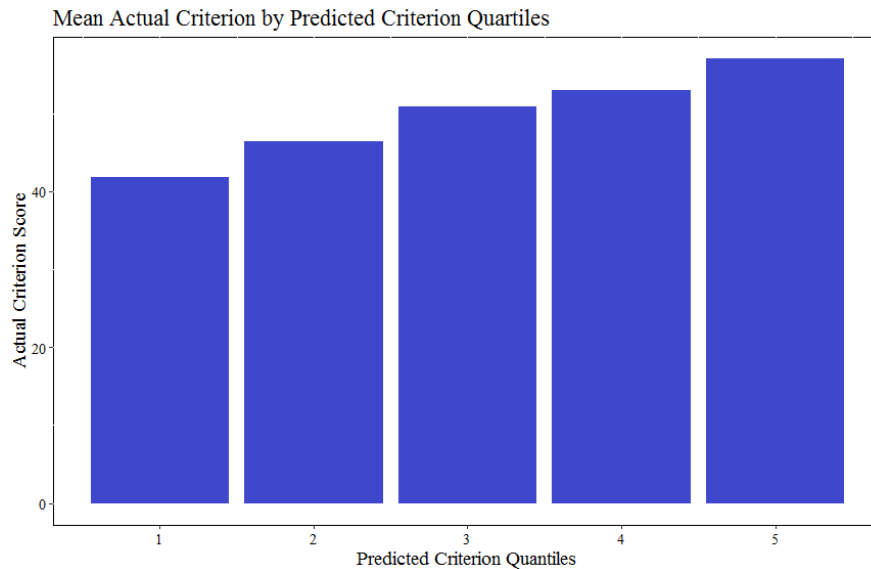
Additionally, this allows technical experts to have detailed conversations with laypeople about a very complex set of topics (Personality and Regression Analysis) with much less confusion

Job #2

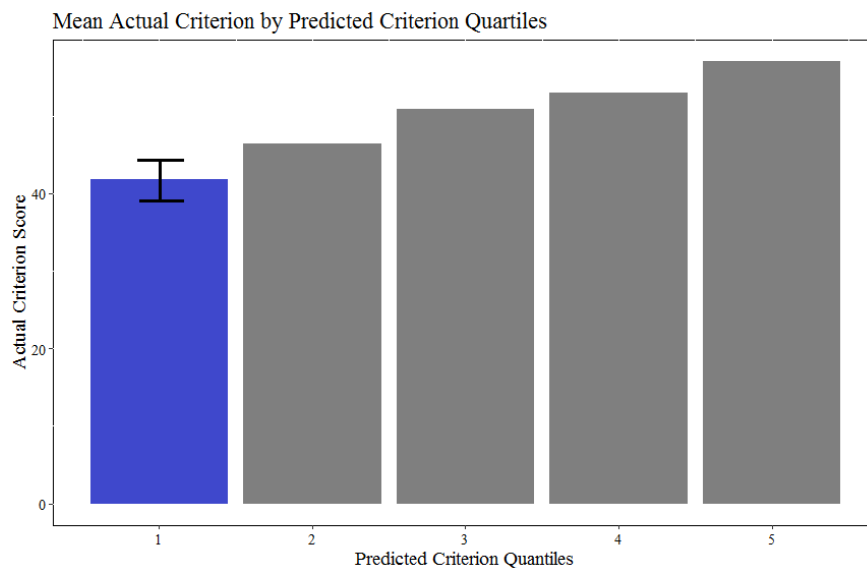


A.J. Thurston

Suppose I have an organization with an expensive training program. The program concludes with a final test which demonstrates a minimum level of competence and must be passed to graduate (score > 45). The pass rate is declining. I've been asked to develop a screen-out system for their program. Here are the validation results of that system.



I start by orienting them to the plot, the x-axis shows predicted criterion score quantiles, and the y-axis shows the mean actual criterion score for that quantile. I'll explain what the quantiles are and how they were developed, with quantile 1 representing those trainees who scored in the bottom 20% of the predicted score, and those in quantile 5 representing those who scored in the top 20%. In describing how the quantiles were made, I also emphasize this is a simplification of a continuous scale.



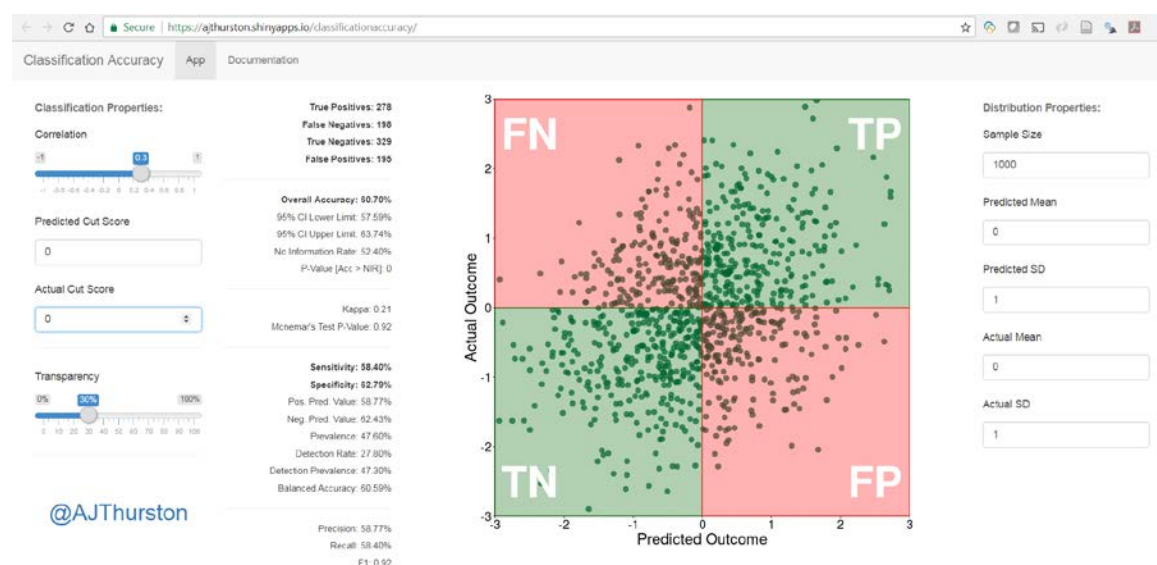
Because this is a screen-out procedure, most of the discussion will focus on those in quantile 1. Here, I will add back some of the detail that's been simplified to create the plot; specifically, the 95% confidence interval for this quantile. In this case, the 95%CI of the actual scores range from ~40–44. Conveniently, I can say anyone who falls into this predicted quantile has a 95% chance of actual failure.

If the cost of failure is quantified, the discussion continues in dollars, but here it's important to be conservative. I'll do so by giving a range of potential savings to temper expectations. The discussion ends by implementing a criterion-referenced cut score based on the training needs of the organization, the cost of failure, and any other client considerations.

AJ also shared an [app he created in R](#) that he uses when teaching about validity in classification decisions. We took screenshots to show how it works. The first example shows a predictor–criterion correlation of .47, with a predicted cut score of 0.3 and actual cut score of 0.5.



In the second example, we changed the correlation to .3 and both the predicted and actual cut scores to 0. The interactive app automatically updates the accuracy statistics in the column to the left of the graph.



Summary

This column was the second in our series on translating validity evidence in applied settings. Whereas last time we asked I-Os for verbal translation examples, this time we asked how I-Os use visualizations to help explain these concepts. To that end, several practitioners shared some of the creative ways they simplify validity evidence for nonacademic audiences. We are extremely grateful for these contributions and hope that you will be able to use these resources to craft better, clearer, and more impactful visual representations of research findings.

We generally feel that I-Os excel at carefully designing and conducting applied research, then methodically cleaning and analyzing the data to uncover meaningful and impactful results. However, scientific rigor means nothing if decision-makers do not understand the results and the benefits and consequences of acting on results versus inaction. With this theme in mind, we'd like to close our *Lost in Translation* series with a rather critical and possibility controversial assessment of our field. This may seem like an odd critique, but we believe that generally, I-O psychology graduate programs are not doing an adequate job of preparing students to be effective communicators of our science and ambassadors of the field. Despite claiming to be trained in the scientist-practitioner model, our formal education asymmetrically emphasizes traditional academic science communication, while virtually ignoring the burgeoning and crucial aspects of public science communication (i.e., Sci-comm). That is not a bad thing! But it does help [our inspiration for this series](#) come full circle. Maybe graduate programs aren't currently equipped to teach the translation of science into practice.

Internships and consulting opportunities certainly exist for students in some programs, but perhaps a part of the solution to maintaining our relevance is to formally incorporate "translation" into the graduate curriculum. Intuitively, academics seem best-suited to prepare students for academic careers: they are scientists who are incentivized by publishing new theory and rigorous research studies in peer-reviewed journals with an academic audience. Wouldn't it make sense to hire practitioners as adjunct professors—not to teach core I-O classes but rather to advise how the complex topics we learn function and are talked about in businesses?

For a field that traces its roots back to the late-1800s and whose flagship journal recently [celebrated its centennial](#), we are woefully irrelevant to the majority of HR and business professionals (Rose, McCune, Spencer, Rupperecht, & Drogan, 2013). One of the most popular and provocative *TIP* articles of 2017 blatantly questioned whether I-O psychology has lost its way and identified other fields that are becoming better recognized than we are for the things that I-Os do best (Ones, Kaiser, Chamorro-Premuzic, & Svensson, 2017). We believe that our generally inability to effectively translate research findings into simple and actionable knowledge for organizational decision makers is a momentous impediment to our field's continued relevance.

Many scientists are now using R, Python, and other languages to create custom and flexible visualization tools. Science communication continues to emerge as an independent field as the scientific community and general public realize the criticality and shared goals of open-source accessible science—this includes communicating complex research in a way that can be digested by the general public. For the sake of our field's effectiveness and relevance, it is time for I-O to get with the program. We hope that graduate programs will take note and better prepare I-Os to effectively communicate science to a larger, more diverse, and nonacademic audience.

In addition to the contributions above, we'd also like to thank **Evan Sinar** for pointing us toward several validity and general data visualization resources that we found to be particularly useful:

Visualization resource	Description	Author(s)/creator(s)/host(s)
Graphical descriptives	Dynamic analytics platform that allows visual exploration of univariate and bivariate scatterplot matrices, group means, moderator analyses, & regression assumption checks	Louis Tay, Scott Parrigon, & James LeBreton
Seeing theory	A visual introduction to probability and statistics	Daniel Kunin & team
Interpreting correlations	An interactive visualization tool that helps with the interpretation of correlations, Cohen's d effect size, null hypothesis significance testing, and interpreting confidence intervals	Kristoffer Magnusson
Visualizing regression	A guest post on Stephanie Evergreen's website that focuses on guidelines for effective visualization of regression	William Faulkner, Joao Martinho, & Heather Muntzer
Show me the data!	An ongoing compilation of key data visualization links and resources originally developed for a SIOP 2016 workshop	Evan Sinar, Eric Doversberger, & Kristin Charles
Alternative effect size calculator	An interactive app that allows you to upload your data, set criterion cut-offs and other parameters, and visualize expectancy charts, density plots, and common language effect size indices	Don Zhang

Acknowledgements

We have had quite the journey over the past 2 years and six columns. In addition to the 40+ interviewees who contributed to our columns, we'd like to express our sincerest gratitude to **Tara Behrend** for trusting two relatively unproven and definitively naïve graduate students with an opportunity to make a substantive contribution to our professional organization's official publication. She even suggested "Lost in Translation" as a potential title. Thank you for trusting us, Tara. We hope this column lived up to your expectations.

What's Next for Lost in Translation?

This is last column in our recurring *Lost in Translation* Series. We are going to take some time to consider how we might take *Lost in Translation* to the next level. If you just can't get enough, please consider attending our SIOP 2018 Executive Board Session (I-O Value [No Longer] Lost in Translation http://www.siop.org/Conferences/18con/Regbk/EB_block.aspx).

Interviewee Biographies

Don C. Zhang is an Assistant Professor in the Department of Psychology at Louisiana State University. He received his PhD from Bowling Green State University. His research focuses on decision making, statistical communication, and employee selection. He is particularly interested in why many managers are reluctant to use evidence-based hiring practices such as structured interviews and mechanical data combination methods. He can be reached at: dc.zhang1@gmail.com

Michael L. Litano is an independent consultant and a principal associate on the People Analytics team at a large *Fortune* 100 company. He earned his PhD in I-O Psychology from Old Dominion University. He specializes in measurement, assessment, and advanced applied statistics. Michael's research interests lie mostly in leadership, employee engagement, and diversity and inclusion and is passionate about increasing the awareness and use of I-O psychology in organizations. He can be reached at mi-chael.litano@gmail.com

Daniel R. Hawthorne is the director of I-O Solutions, WorkFORCE Innovation within the Global Education and Workforce Division at Educational Testing Service in Princeton, NJ. Dan leads the I-O Solutions team by providing consultative, evidence-based solutions to internal and external clients, acting as a liaison between the ETS Strategic Business unit and ETS Research and Development, and advancement of US- and global-based business opportunities for ETS. He also provides direct client-facing leadership in client management and account development through the development and implementation of scalable and repeatable I-O solutions.

AJ Thurston is an I-O Psychology PhD candidate at the University of South Florida. He specializes in assessment and selection as they apply in military and veteran contexts. He is passionate about communicating I-O using data visualization, animation, and interactive web applications.

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The Modern App: How Technology Is Advancing Team-Centric Work

Evan Sinar
DDI

Tiffany Poeppelman
LinkedIn

Over the recent years, influential industry analysts (e.g., Bersin, 2016; Haak, 2017) have repeatedly cited the shift to team-based work as a major business trend warranting a fundamentally reshaped approach to talent management and organizational structure. These disruptive forces are driving workflows that are less often hierarchical from a long-term supervisor and more often lateral among project-based teams, and processes that are less often serial and more often parallel using agile methodologies. Additional interest in workplace teams is also on the rise within major I-O publications such as the *Journal of Applied Psychology* (Mathieu, Hollenbeck, Knippenberg, & Ilgen, 2017). These trends piqued our interest in understanding the major trends across technologies that have shifted the way we work since our [Modern App review](#) of virtual working in Jan 2015, and to see what is top of mind in today's practice and for today's researchers.

In this edition of the Modern App, we focus on the possibilities—and realities—of the technologies that enable team-centered work. We begin with an overview of the various technologies and tools that are rapidly gaining a foothold in the workplace, and we then shift to sections—taking a representative rather than a comprehensive view—of what the latest research within and outside our field tells us about the intersection of teams and technology for virtual teams, collaboration and team-building tool adoption, and the measurement of team dynamics, including a preview of relevant sessions at the upcoming SIOP 2018 Annual Conference in Chicago.

Team-Centric Workplace Tech: Reviewing Market Forces and Emerging Offerings

Borders are no longer barriers with the advances in modern technology. These tools allow employees to work from almost anywhere in the world and push the boundaries of virtual work, both well-aligned with the pressures of the global business environment. Due to these abundant application opportunities, there are no lack of collaboration technologies in the marketplace.

Executives in global corporations are investing in technologies to improve within- and cross-team workflows to boost business performance and ensure collaboration for in-person and virtual teams. Many technologies, platforms, and tools are ones that we've seen on the market for the last 3+ years, but their product functionality lists have only continued to lengthen as organizational demands drive deeper investment to meet the changing needs of the enterprise. These tools often fall into **eight general categories**, although the applications for cloud-based team/group-enablement software are increasing by the day:

1. **Social platforms** that allow for real time communication such as [Chatter](#), [Yammer](#), [Jive](#), [Teams](#), and [Slack](#)
2. **Planning tools** for team project task management such as [Trello](#), [Monday](#) (formerly Dapulse), [ProofHub](#), [Smartsheet](#), and [Asana](#)
3. **Organization of notes** from group meetings such as [Evernote](#) and [Notebook](#)

4. **Information repositories** to access and store team materials such as [Dropbox](#), [Google Drive](#), and [Sharepoint](#)
5. **Videoconferencing** for collaborators to meet real time or desk share materials such as [Zoom](#), [BlueJeans](#), and [Skype](#)
6. **Building environments** for product development or team coding environments such as [Google Docs](#), [Igloo](#), [Github](#), and [Codingteam](#)
7. **Group crowdsourcing and curation** of content and ideas such as [AnswerHub](#), [Coggle.it](#), [Pandexio](#), and [Spigit](#)
8. **Text to speech capabilities** that offer automatic and human transcription for audio and video files exchanged across teams like [SpokenData](#) and [Amazon Transcribe](#)

Other technologies that are already here are supporting the recording day-to-day work practices with the intent of coaching team members on their daily work practices. These include recording customer calls to provide the right investment in training on core skills such as sales or other support functions. Some examples of these manager-to-employee coaching tools include [Monet Software](#), [Join.me](#), [WebEx](#), [Brainshark](#), [Gong.io](#), [Ambition](#), and [MindTickle](#).

Of course, why stop there when the analyses of the calls and recommendations are being requested, which is leading companies to use a combination of tools such as web meeting apps, like [Zoom](#) and [Gotomeeting](#), together with software like [ExecVision.io](#), and [Chorus.ai](#) to automatically record and transcribe calls, and then analyze them for insights.

The Technological Trends

Across these technologies and tools, we see four recurring themes.

First, mobile matters—that is, most collaborative and team-oriented technologies are investing in mobile access capabilities to ensure people can access these same services on the go.

Second, collaboration will continue to remain in the cloud—most technology tools for use within teams run on the cloud, often requiring steeper investments and larger storage requirements for companies.

Third, creative communications will be a key feature to access and share team resources being stored—many of these tools, and other newsletter features such as [MailChimp](#) and [Sway](#), allow companies to consolidate messages or display information interactively to improve engagement and responsiveness.

Finally, data is being collected everywhere and is being leveraged in new creative ways to provide insights to companies and employees for analyses around work dynamics, collaboration, and development opportunities.

Three Categories of Teams and Technology Research

Next, we turn to the research base for teams and technology, within and outside of traditional I/O publications, centering on three topics: virtual teams, collaboration tool adoption, and new measurement possibilities for teams and groups resulting from new technologies.

Leading and Working in Virtual Teams

Virtual teamwork appears to be the most-researched facet of the team-technology intersection. In their review of 10 years of virtual teams research, Gilson, Maynard, Jones Young, Vartiainen, and Hakonen (2015) identify 10 themes, one of which is technology itself. They recognize technology's role to facilitate communication and monitor performance of virtual teams but raise cautions that technology can interfere with high-functioning virtual teaming due to delays and a lack of clarity in intrateam communication. On a positive note, however, they review several studies finding that computer-mediated communication tools can reduce social loafing and between-member status differences, whereas group-oriented communication tools can strengthen social ties among team members. Notably for future researchers, Gilson et al. designate modern group communication tools (e.g., document co-creation, meeting tools, project management tools) as particularly underresearched components of the virtual teams landscape.

As a sign of work currently underway to represent the current state of I-O research on the topic, virtual teaming is also a topic for two SIOP 2018 sessions: Ng, DeChurch, and Contractor (2018) will be presenting the session *Information Sharing in Online Teams: How Interventions Improve Information Processing*, investigating whether “group information processing interventions [...] improve information sharing during online team discussions.” Smoak, Murphy, Moye, and Deere (2018) will present on *Working, Leading and Learning Virtually: Storytelling and Roundtable Discussion*, and “will share stories of enabling virtual leaders, learners, and the broader workforce”.

Turning to the leader's role in managing successful virtual teams, these teams require leaders who can adapt to new forms of collaboration and interaction that can no longer rely on direct interpersonal contact. This remains a challenging skill for many current leaders. A recent study (DDI, The Conference Board, EY, 2018) found that leaders were less confident in their ability to lead virtual teams than any of 15 other skills rated. Nor are Millennial-generation leaders confident in their ability to excel in this skill: they rated themselves significantly lower in leading virtual teams compared to Generation X and Baby Boomer leaders. As a result, it's unlikely that leader proficiency levels will change merely by an infusion of younger employees into leader roles: dedicated development in virtual team leadership as a distinct leader skill for leaders at all levels and of all generations may be needed.

Adoption of Workplace Collaboration Tools

Though a less concentrated base of research compared to virtual teams, research into collaboration tool acceptance and employee use is arguably no less important for the organizations investing heavily by

installing and encouraging adoption of these tools, and seeking resulting ROI. Three studies from the information technology discipline provide initial evidence-based guidance about techniques to boost collaboration tool engagement:

- Maruping and Magni (2015) found that empowered teams were more likely to have higher intentions and expectations to explore the use of team collaboration tools.
- Pillet and Carillo (2016) found habit-forming to play a moderating role between perceived ease of use and knowledge sharing via the tools.
- Bayerl, Lauche, and Axtell (2016) examined adoption processes for new team collaboration and video-conferencing software, identifying the roles of both attitude and rationale in securing sustained adoption within and across teams. They conclude by recommending that “organizations need to acquire a new mindset, which treats technology changes in collectives not as a one-time deployment, but as a process that requires management on a continuous basis” (p. 782).

These research streams are critical to counteract the headwinds that collaborative tools often face. Successful implementation and positive returns on investment will only come after overcoming passive or even active resistance by team members overwhelmed by the demands of an “always on” communication cadence (Mankins, 2017).

Enabling New Forms of Team Measurement, Gathering Richer Team Data

Technology advances have also propelled the nature of teams research itself by dramatically expanding the volume and variety of data that can be gathered about team interactions and group dynamics (Carter, Asencio, Wax, DeChurch, & Contractor, 2015). These technologies include wearable sociometric badges that track proximity, ambient sound, and other parameters that can be used to code and classify interactions among colocated coworkers. Although these devices are not without their measurement perils (see Chaffin et al., 2017), when rigorously implemented, they can unlock a rich and incremental level of data about team interactions. The work of Kozlowski and colleagues (e.g., Kozlowski, 2015; Kozlowski, Chao, Chang, & Fernandez, 2015) – targeting one of the highest-stakes teams soon to be in existence, the astronauts traveling and working together on missions to Mars – is a model such project.

Summarizing and Looking Ahead

With the continued rise of virtual work and further investments into workplace flexibility for employees to have options for their work arrangements, we anticipate continued advancement in many types of technologies to support team dynamics. By providing an environment that works for everyone, this will result in companies continuing to offer multiple locations where employees can work together, and/or a mix of remote working days as needed from anywhere in the world.

As we watch this space, we’re confident that we will see future acquisitions and merger of these technological features and tools which will result in limited products that do end to end planning, storage, analysis, sharing, and tracking.

Additionally, with the younger generation entering into work with new ways to work, investments will continue to be made around the development and integration of technologies into K-12 programs (Boorstin, 2017). We are already seeing schools and programs that are training youth through these tools so they can experience team dynamics.

Although these are just a few snapshots on what is being used within organizations today, what is coming out from our own I-O research, and what we might see in the future, we are more excited to see the way these data sets and technologies will continue to push the boundaries in the team and technology space.

Do you have other technology examples you'd add to the list above or ones that you've found to be extremely effective in your own team work? Please contact us on LinkedIn ([Tiffany Poeppelman](#) & [Evan Sinar](#)) or Twitter ([@TRPoeppelman](#), & [@EvanSinar](#)).

Ideas for future Modern App *TIP* columns? We are always open to ideas on what you'd like to see covered.

Last, see below for the full set and topics of our Modern App columns since January 2017:

- 2017 Technology Trends: Are I-O Psychologists Prepared? [January 2017](#)
- #SIOP17 Program Preview: Technology Roundup for Orlando [April 2017](#)
- #SIOP17 Review: Technology Takeaways From Orlando [July 2017](#)
- Modern App: Don't Believe (Most of) The Technology Hype [October 2017](#)

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The I-Opener: Earth, Wind, You're Hired!
Or: How I Learned to Stop Worrying and Love Helping Small Businesses Using I-O

Vinay Patel and Steven Toaddy
Louisiana Tech University

Thomas Toaddy
Retired HR Manager

Okay, so the title of this one is a joke,¹ but we should explain it briefly before we dive into the real topic here.

It rubs our sensibilities the wrong way when we hear about hiring practices that are anything but ironclad, legally defensible, and well validated. The use of unstructured interviews or clinical decision making or gut intuition, instances of nudging the results of a mechanical decision-making process if one doesn't "like" the results, people hiring based on liking the cut of one's jib – or, as we joked in our title, hiring based on similarities in musical preferences.² Perhaps it rubs your sensibilities the wrong way as well.

But throwing a fully validated, ironclad selection system based on an up-to-date and thorough and appropriate work analysis at a situation like a self-employed journalist hiring a personal assistant is simply not prudent.³ In terms of time, and scalability, and (at least at present) sheer availability of expertise to execute appropriate selection practices, our party line neither does nor, we argue, *should* compel individuals in such circumstances to institute full scientifically based, validated selection practices. So what line *would* and *should* compel in such a situation? How can we use what our field knows to improve selection practices in these real-world situations? Indeed, whom must we compel—business owners or ourselves?

Perhaps you are rolling your eyes at this point—perhaps you are thinking, “Of *course* we wouldn't suggest such practices in such circumstances; instead, we'd suggest X.” Good! That's where we're trying to bring everyone via this article. Let's make sure that we know what folks' big struggles are and that we have something to contribute in those situations, though.

Perhaps you are rolling your eyes at this point. Perhaps you are thinking, “Why would I bother trying to help people who can't afford my typical services?” Here are three reasons:

- We want to be the go-to folks when it comes to work issues. This means being on everyone's mind, not just the minds of the big guns.
- It is a small world—outside and inside of I-O alike. Dismiss anyone at your peril.
- If we can do good in the world, let's, no?

So we set out upon a two-step process: First, we leaned heavily on our third author's career's worth of experience in HR to spin up a metaphor for what we were discussing and to guide our questions and selection of interviewees at both of the following stages. Then, we went to the individual who inspired this topic⁴ and who does not traditionally work with us I-O folks. We sought to capture hiring issues in terms that are understandable to us I-O folks whilst honoring the nuances of our respondent's own language (thanks to John for doing so well in speaking both of our languages and thanks again to our third author). Then, we pulled out some focal topics and delivered these to some I-O folks with the challenge of “Hey, what can we do for this guy and others like him?” Let's walk through those three steps in turn:

First, a Metaphor

As soon as or even before they are aware that landscaping is a deliberate, well-considered practice, most people realize that they want to have a beautifully arranged and maintained lawn/garden/ grounds.⁵ Such work is not easy, though—it requires both expertise and effort, and doing the job poorly will result in a displeasing, sloppily arranged mess of a yard that everyone else will immediately be able to see, eliminating the chance that the offending individual will be invited to parties in the future.⁶ In such a position, one has two options: learn to landscape, roll up sleeves, get to work; or hire a landscaping firm. If one(’s family?) is large enough and wealthy enough, both options are viable—task someone in the family with landscaping, or fire off some money to get someone else to come out with a whole team, to sketch out a plan, sell it to the family, and get to (and continue to get to) work. If one cannot afford either approach—for lack of time, money, and/or a lawn of adequate size to get bids from landscaping firms at all—one is kind of, as they say, hosed.⁷

Many of you may be scratching your heads (not just because of the use of metaphor) at this point, though—you *are* in this latter group, and you *do* have an impressive lawn, and you *aren’t* a landscaping expert. How did you do it? Perhaps you reached out to your local extension office or to your local master gardeners (or to a friend with similar credentials or to Internet) to furnish (counterfeit?) just the expertise that you needed to take care of your own lawn—you don’t know anything about fruit trees but you don’t care because you don’t have any, so you just asked about the maple in your front yard. Perhaps you banded together with your neighbors to pool enough lawns and thus enough work to warrant the attention of a landscaping firm.

But what about I-O services instead of landscaping? What about high-quality, effective, legally defensible hiring practices instead of an attractive lawn?

Straight to the Heart of the Matter

We gave John Davis, president of Paul Davis Automation, a ring to further discuss this topic. John’s situation has been in the back of the second author’s mind for the past several years as an example of someone whom the second author couldn’t help with all of his fancy I-O tools. After a short conversation that was totally proFRESHinal, we dove right in to the matter.

We started off by asking John how he approaches hiring in his organization. He told us that he approaches hiring in a unique way, in that he keeps a list of individuals who he has either met or found on LinkedIn whom he feels would be a good addition to his organization. When a position opens up, he goes through that list to interview them. His interviews consists of having lunch or dinner with the potential hire about 10 times, and he uses intuition to make his decisions. There are a few reasons he prefers this method over using formalized tools, and surprisingly, cost isn’t one of them; he would much rather pay to get a great hire the first time rather than going back to the drawing board.

The reason why he isn’t using formalized tools is because they’re simply a foreign concept. Being the president of a small business, he’s never had good luck with using tests for hiring. The reason being, because of the nature of the business and work, employees are almost required to do a variety of tasks that aren’t clearly categorized within one specific job. According to John, most business owners may be aware of liability and of other HR-related issues, but they are not aware or familiar with the proper I-O techniques used to hire.

We were grateful for what John shared with us—not because it bodes particularly well for the services offered by the field of I-O being of benefit to him, but because we thought that he did a great job of conveying the multiple levels of complexity associated with his position. From where John stands, tests are unavailable or incomplete, recruitment practices are deliberate but unsystematic, and he’s looking for a better way but hasn’t heard of one yet. What suggestions or comments does our field have for John? How can we make I-O services more accessible (and possibly more affordable) to the general public? Here are what a few practitioners have to say:

The Context, the Problem(s) and the Solution(s)

Our next set of interviewees helped us think about and, in some instances, reframe the problem—both the problem that John is facing and the problem that others like John face. Each of them was helpful in brushing aside the notion that we always need to do expensive, time-consuming validation work the moment that we walk into an organization (or, indeed, ever); they helped us see ways that we could provide right-sized, low-cost solutions that would add as much value as possible—as much exposure to and use of the I-O toolkit—with as few pain points as possible. These folks gave us much more information that we have room to share here, but perhaps the most valuable pieces that we can cover are captured below:

Points to Consider

From the conversations with our folks, some of the reservations we had about our field were reinforced. Each of our guests shared the same concerns about our profession, and saw it as an opportunity to fix the field rather than to just call this state of affairs a weakness. In **Neil Morelli’s** (head of Selection Science for The Cole Group) experience, there doesn’t seem to be any availability of I-O to small business. In fact, he says probably about 90% of small businesses haven’t even heard of I-O. **Luke Simmering** (Talent Solutions consultant at CEB, now Gartner) has similar experiences and says that smaller companies don’t have the same advantages that I-Os know about. So in summary, what we have here is an opportunity to benefit small companies and even help with legal vulnerability.

Why do we have this issue in the first place?

Why is I-O so largely unavailable to small businesses? **Kyle Morgan** (associate consultant at Aon) tells us that one of the reason our field may not be able to help is that the juice isn’t worth the squeeze; it’s expensive when it comes to the ROI. He’s not wrong; our services can add up quickly and may not be something that is affordable to small business, at least as our services are traditionally packaged and sold. Second, the marketing skills of I-Os aren’t all that impressive.⁸ Neil comments on how we as I-Os can do the best job when it comes to designing a selection and recruitment system but are not good when it comes to marketing—it’s just not what we do. This could be another potential reason why I-O isn’t well known in the small business community. Because we now know that we are, at least currently, expensive (duh) and are terrible at marketing, why are we even bothering ourselves with this, or more importantly, why should smaller organizations even bother with I-O?

Should smaller organizations even bother with I-O?

In short—yes (you may skip to the next section). Although larger firms may not be able to provide consulting services to small organizations,⁹ boutique firms exist and can do just that, and they do this by providing, in some cases, *different* or *different levels of* services than larger firms provide. So yes, something can be done here. Luke says that there is always a middle ground, and our other experts also agree. Kyle thinks we can always add value or give advice. All three of our experts stress the value of having a good/credible relationship with managers in smaller organizations.¹⁰ Building credibility will help managers understand how much

value we can actually add to their business. Neil says we can't approach small businesses with our rigid I-O steps like we normally would, but we can start by incorporating something small without deviating from core I-O principles: data-driven decisions, operationalization, conceptualization, and standardization.¹¹ From Luke's point of view, once we get our foot in the door we can start to shape what managers do to make it more I-O. Now that we know that we can truly help small businesses, how should we start?

What CAN We Do?

Surprisingly, a lot. Without compromising on our core I-O principles and by creating that trusting and credible relationship with these businesses we can: provide better and more qualified employees, reduce adverse impact, and retain good employees. Neil says that we can do all of this by starting to speak the language of business—and not just in terms of jargon, but in terms of ROI and strategic HR and objective-oriented planning. Without this, we can be hard to understand or, worse, uninteresting and irrelevant. Next, all three of our experts agree that we should start by supplementing whatever the small organization already has with an I-O best practice. This shows them how much utility and ROI we can provide them. This helps reduce any apprehension they may have towards I-O. Essentially we are helping them take a step in the right direction by giving them proper methods.

Some issues that are relevant to small business include:

- increased turnover;
- hiring individuals that are required to do more than one job;
- ending up hiring people that aren't cut out for the job.

Luke suggests that these businesses should start to measure competencies that touch different aspects of the jobs. Then give candidates realistic cultural expectations and job previews to help reduce turnover. However, this is a candidate's market; managers need to make sure that they give off the best (and accurate) impression of their company. Similarly, Neil and Kyle recommend selecting employees based on competencies. Neil takes it a step further and also recommends that organizations should always link their hiring process to overall goals. Look at the organization's needs and hire based on that. I-Os should use experience and stories to motivate managers and build social capital. Once we achieve referenceability, we can paint a picture of how we were able to help someone in a similar situation. Specifically in Paul Davis Automation's case, John is already aware of I-O—we can begin to push him a little and to translate I-O into his world. He should think strategically and look for observable, measurable business outcomes. This gets him away from the purely subjective process. As far as recruiting goes, Neil states that there could be a more holistic recruitment strategy as far as understanding and setting up a talent pipeline: setting up an employee referral program, creating ads and thinking about employer brand, and assessing current and previous employees to see what could be done better. What do we need to do on the business side for the brand? At the end of the day we can design a process that is empirical. This all happens when we step back and relate all systems to the overall goal.

However, an unaddressed problem still exists: there are more small business than are I-Os.¹² How can we cater to them all? Should we just put resources out there and let folks apply them?

Should we automate?

Well, this is a complex question isn't it? Kyle believes that encouraging small businesses to talk to us—especially if they encounter a problem that they haven't before—is the best approach. When it comes to putting resources out there and letting folks apply them both Kyle and Neil recommend that someone

with a smidge of technical training should be the ones to use and implement these tools. We can definitely productize some tools and methods, but most I-Os might have a problem with the tools not being specific enough.¹³ However, when small businesses approach us with these tools we can, because of the social capital we have built, customize based on their needs. Eh. This might take a bit of a cultural shift.

What next?

Now that we think that we CAN help small business but are also terrible marketers, what do we do? Luke proposed that larger consulting firms can set up a fund, similar to what we see in the government, that is specifically used to help small businesses.¹⁴ Larger companies and clients that employ these consulting firms can help contribute to this fund. Also pro bono work always helps ;).

Neil suggests that we should (a) outsource our brand awareness for I-O, dispelling some of the myths around I-O and teaching people about what it means to have science around hiring; and (b) create a community of I-Os and support groups that can be accessed by small businesses. This basically breaks down to a matchmaking game between what we can offer and what businesses need. We can start by creating a contact list of I-Os that do consulting with small business. We need some lead-generation or demand-generation system in combination with the marketing campaign. Once matches are made, I-Os can start off with small projects and then switch to a strict maintenance relationship after that.¹⁵

This particular area of applying I-O to small businesses is rich with opportunities to do some good and to help people who could really benefit from what we do. Our experts gave us a nice preview of what we can do, but it is our job as an I-O to help spread this knowledge so that the I-O brand can reach its full potential – which, in the end, serves all of us.¹⁶

Notes

¹ Incidentally so is the title of this recurring column.

² Which *could be* a proxy for race, sex, age, national origin, religion, &c.

³ Right?

⁴ Though, to be clear, he didn't inspire the title of the article—John doesn't hire people based on their musical preferences (as far as any of us are aware).

⁵ As a business or as an individual or whatever – it's a metaphor.

⁶ At least they probably won't sue you for an ugly lawn. Probably.

⁷ This is a technical landscaping term. We think.

⁸ Read: We're awful at marketing.

⁹ Precisely how and why this is the case is beyond the scope of this article, but we concluded that this is, at least at present, indeed the case.

¹⁰ Well, also in larger organizations – but we're talking about the smaller ones right now.

¹¹ All of which can be accomplished on a shoestring budget if one is so inclined.

¹² Well, okay—there are also more large businesses than there are I-Os, and we get along fine. You know what we mean.

¹³ Perhaps the biggest area of selection miscommunication/dissatisfaction is around the word "validity," as in "I bought a valid test from a vendor" >_<

¹⁴ This would allow us to expand our approach so that we could do some of the more fancy and valuable but pricy I-O activities in those businesses, but we wouldn't have to—sometimes just having a free consult (on someone else's dime) could be great.

¹⁵ Of course, it's not going to be this easy, there is the matter of getting people trained up to, you know, DO the things that our experts discussed—aligning I-O with business strategy and communicating that to clients, for instance.

¹⁶ I.e., humanity.

Prehire Screening: A Case Study at CVS Health



Margaret Collins and Meredith Vey¹
CVS Health

“The Bridge: Connecting Science and Practice” is a *TIP* column that seeks to help facilitate additional learning and knowledge transfer in order to encourage sound, evidence-based practice. It can provide academics with an opportunity to discuss

the potential and/or realized practical implications of their research as well as learn about cutting edge practice issues or questions that could inform new research programs or studies. For practitioners, it provides opportunities to learn about the latest research findings that could prompt new techniques, solutions, or services that would benefit the external client community. It also provides practitioners with an opportunity to highlight key practice issues, challenges, trends, and so forth that may benefit from additional research. In this issue, we profile CVS Health, winner of the 2017 [HRM Impact Award](#) for its implementation of an evidence-based, prehire screening assessment for call center job applicants.

Overview of CVS Health

We at CVS Health were honored to receive the 2017 HRM Impact Award. We truly believe in the science-practitioner model for which we were recognized and hope that others consider this prehire screening assessment as a model from which to learn and work. Within this column, we provide a case study of how a team of I-O practitioners applied science and common business sense to build and implement a prehire screening assessment and showcase its value to the highest levels of the organization.

CVS Health is the nation’s leading pharmacy innovation company “helping people on their path to better health.” These eight simple yet powerful words are more than a mission—it’s our purpose, and it’s what guides the company’s 243,000 colleagues as they go about their daily business.

As a *Fortune* 10 company with a unique integrated business model, CVS Health is not your traditional drug store. We have built a combination of capabilities to work with patients, payers, and providers to offer access to lower cost, high quality sites of care and help improve the lives of millions of Americans. To provide a sense of the company’s size and scale, last year CVS Health dispensed or managed about 1.9 billion prescriptions. About half of those were filled at our pharmacy locations and the rest were managed by CVS Caremark, which is the company’s leading pharmacy benefits manager (PBM) with nearly 90 million plan members.

Operating at that scale gives us a tremendous opportunity to make a difference in improving the health of our patients, communities, and colleagues. But it can also challenge us to compete for the talent we need to sustain our operations and thrive in today’s dynamic economy. Our strategic priority to develop a strong pipeline of future talent led us to identify an opportunity to enhance our hiring practices at our customer care call centers. As we share methodology and outcomes, we want to highlight our learning on the practitioner side, which emphasized how “bridging” science and practice was primarily about engaging our business partners early and throughout the project, and demonstrating the value and return on investment they would reap.

Development and Implementation of Customer Care Representatives Pre-Hire Screening Assessment

Because of the cyclical demands of call center staffing in our industry, we hire Customer Care Representatives (CCRs) at a high volume during certain seasons of the year. CCRs are often the front line to our patients, payers, and providers when they need to communicate with our PBM. Our particular challenges were:

- a. We interviewed most applicants, creating a slow and burdensome process for applicants and hiring managers.
- b. We based hiring decisions on resumes and interview performance, but this didn't guarantee that new hires had the required technical skills (e.g., ability to toggle and type) while providing excellent customer service.
- c. Our applicants are also our customers, so we constantly strive to maintain a positive perception of the CVS Health brand in the marketplace.

Thus, the goals of our intervention were to improve and streamline the existing selection process while providing an engaging candidate experience and increasing new hire performance.

Applying the Science of Psychology to our Screening Solution

We adhere to best practices as prescribed by the *Uniform Guidelines on Employee Selection Procedures* (EEOC, 1978) and the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999), and develop job-related assessment content. This involves:

- **Conducting extensive job analysis** to ensure content validity
- **Using a battery of measures**, such as situational judgment, high fidelity work simulations, and biodata to measure a range of technical competencies and work fit
- **Including a realistic job preview** to engage applicants and provide additional context so they could evaluate job fit (Kang & Yu, 2014)
- **Conducting a concurrent validity study** to refine content and develop scoring algorithms that maximize validity and minimize subgroup differences
- **Pilot testing** assessments to ensure they function as intended
- **Continuous monitoring** of results

After the CCR assessment had been in place for a year, we examined its impact on administrative efficiency and quality of hire. We had several robust metrics that were available before and after implementation, allowing us to apply a pre-post quasi-experimental design comparing new hires *sans* assessment to new hires with an assessment. It was also impactful to calculate the hours and dollars saved by automating the first stage of screening, given that prior to implementation, we had a high touch process to screen all applicants. For more detailed information about our methodology and the significant gains in effectiveness and efficiency, see our HRM Impact Award [profile](#).

Bridging Science and Practice

Before delving into how we spanned the bridge, we would like to highlight the advantages of conducting research in the business world. First, our work directly impacts business outcomes. Research conducted with real incumbents and job applicants may yield critical information that confirms or enriches research findings conducted in controlled settings. In addition, as we have found at CVS Health, the inarguably positive results of successfully implemented assessments set a precedent and facilitate future opportunities for similar projects.

Still, even a rigorously developed and vetted screening assessment requires significant commitment from leaders who are ultimately focused on running their business. We identified three primary methods of impressing on leaders the importance and value of our work: evidence-based science, project management, and stakeholder alignment. We've shared our evidence-based approach, and for project management practices we refer you to information shared by previous HRM Impact Award winners, such as Jack-in-the-Box (Schiemann & Seibert, 2017) and Bank of America (Niedle & Littrell, 2016). We outline best practices for stakeholder alignment below, in the hope that they provide take aways for early-career I-O practitioners and students on how to maintain stakeholder enthusiasm.

1. Identify your stakeholders. It is critical to know who your stakeholders are and understand their interests and preferences related to the resources you are about to request and the impact of your project on their responsibilities. The most obvious stakeholders are operational leaders. Below are examples of other stakeholder groups who have been integral to the success of the CCR project:

- a. Talent acquisition (TA): Prehire screening assessments are resources for and part of the acquisition process. We share with TA the goals of engaging applicants early in the process and building a high quality workforce. At the same time, there is an inherent tension between our goals of both screening out applicants and screening them in, as quickly as possible.
- b. Human resources business partners (HRBPs): HRBPs are the practitioner's best friends. They help us reach operational leaders on whom we rely for resources (e.g., job analysis participants, content reviewers, raters). Furthermore, they are often the first colleagues that hiring managers turn to when they have questions (or doubts) about the tool or the process.
- c. Vendors: We want work done well and economically. Vendors need to adhere to science and regulatory requirements and best practices. Although there is not just one right way to achieve this objective, it is important to identify the right blend of efficiency and integrity. It is also important to maintain transparency across multiple vendors, especially regarding progress and risks that might impact their work.
- d. Applicants: Job applicants are our customers and even if they do not receive—or choose to accept—an opportunity, we want to leave them with a positive impression of our brand.

2. Never stop working for stakeholder buy-in. Obtaining buy-in is not just an up-front activity. It requires continuous work from start to finish of a project and well past implementation. As new colleagues enter hiring leader roles, as tenured colleagues' familiarity with the original implementation ebbs over time, and as applicant volume fluctuates (creating pressure to fill roles), practitioners have to reiterate why we use an assessment and how it brings value. The subsequent best practices are approaches we found valuable to obtain buy-in for the CCR assessment.

3. Manage expectations. The development of a customized, valid assessment is not a speedy solution. Transparency and communication is critical and the first and most important information for stakeholders is:

- A realistic timeline;
- A relatively accurate description of the resources required; and
- Assurance that significant resources up front lead to significant gains in the long term.

Prior to launching, we shared our learnings from similar projects in other areas of our business and from stories shared by similar organizations. It was also helpful not just to tell them how we leverage technology but to show them examples of engaging, multimedia assessments.

4. Collect, incorporate, and showcase input from the business in every facet of development, validation, and implementation. Conversations with and feedback from the business were critical to the success of this assessment. For example:

- We convened a steering committee with leaders from the business, from HR, and TA. We documented discussions and key decisions made by this committee.
- Subject matter experts (SMEs) from the business informed the work by describing work requirements, what differentiates successful from unsuccessful new hires, and the rewards and challenges of the job. This was resource intensive but essential to creating content that engaged applicants and resonated with our stakeholders.
- Managers reviewed the draft content and provided feedback before it was finalized.

Post implementation, this has helped us reinforce how the assessment is uniquely suited to CVS Health. Two years later, new managers continue to ask “what the assessment is about? How do I know it works?” We are able to tie content back to the contributions of SMEs most salient to the person asking the question (e.g., trainers in their location). We can also share exactly how a leader’s feedback informed a change in direction, and provide the supporting rationale.

5. Demonstrate the value in stakeholder language. Sometimes, the biggest learning curve after leaving school is handling the lack of enthusiasm from business leaders over phrases like “criterion-related validity” and “statistical reliability.” To be fair, this is not always the case. Leaders are metrics-oriented and appreciate significant results. More typically, our stakeholders are interested in the following types of information:

- What does it measure? Does it measure everything I need?
- Is it really improving the quality of our new hires? What is the percent increase in quality [or productivity]?
- How is it reducing turnover?
- Is it too hard [too easy]?

We can describe how the content was created and refined based on SME input; for example, referring back to the scenarios gathered during the job analysis to show how the tool captures not only job requirements but the context of work.

All the validity and outcome data is available and we meet periodically with leaders to address their questions. But, it is critical to describe data in such a way that resonates with leaders: how the assessment differentiates job applicants and leads to improved operational outcomes.

Of course, as our performance metrics partners at Mattersight noted, data are great but only as good as it is meaningful to the people with whom we share it. It’s been important to understand the audience’s comfort level with data visualization and to tailor the message accordingly. This applies when sharing data with other analysts as well. As analysts working closely with data, it is easy to forget that it is not intuitive to third parties.

As our assessment partners at Shaker noted, the administrative efficiency gained by simply adding an assessment to a hiring funnel gets little attention in the literature relative to demonstrating posthire impact on performance and retention. The large immediate and measurable result realized in the first year of ad-

ministration was the reduction in time spent sorting through less qualified candidates. Although the literature largely ignores the practical utility and ROI this provides to organizations using assessments as an early step in their process, it receives heavy attention from the highest levels of the organization.

Summary

Our biggest learning from the CCR assessment project is that building the bridge involves engaging stakeholders at the beginning and continuously working to ensure their buy-in for the long term. We did this by identifying who our stakeholders are, understanding their expectations and how they operationalize ROI, identifying business metrics and outcomes that are important to them, and translating empirically based results into metrics that resonate with them. At the end of the day, operational leaders may not be swayed by our adherence to the *Uniform Guidelines* but may be more influenced when you can say “we literally saved 3 years’ worth of recruiter time in the first six months of using this tool.”

We won minds by showing data that the assessment saved time, increased training to proficiency, benefited overall performance on measurable outcomes, and provided an informative and engaging candidate experience. We won hearts by showcasing the experience once the assessment was developed so our stakeholders could experience for themselves the custom nature of it and the way in which it is deeply contextualized to our business. We continue to learn more and better ways to carry out our work, but so far, we’ve found that the remaining gaps in that bridge can be smoothed out with strong project management and clear, two-way communication with stakeholders.

Calling Potential Contributors to “The Bridge: Connecting Science and Practice”

As outlined in [Poteet, Zugec, and Wallace \(2016\)](#), the *TIP* Editorial Board and Professional Practice Committee continue to have oversight and review responsibility for this column. We are happy to announce that, starting April 2018, Kimberly Adams (kadams6006@gmail.com) and Stephanie Zajac (szajac@houstonmethodist.org) will be assuming editorial duties for this column. We invite interested potential contributors to contact them directly with ideas for columns.

Note

¹ We offer special thanks to Gabriel Lopez-Rivas, CVS Health, Daly Vaughn and Carter Gibson, Shaker International, and Scott Inns, Mattersight for their work on the assessment project and contributions to best practices and lessons learned in this article.

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On the Legal Front: You Say You Want a Revolution

Rich Tonowski

The opinions expressed in this article are those of the author and not necessarily those of any government agency. The article should not be construed as legal advice.

But is the revolution, if you got one, the one you wanted or expected?

The hottest news is the #MeToo revolution. It is especially remarkable because it was not based in any new legal promulgation but by the rise of consensus that sexual harassment in the workplace really is unacceptable. EEOC can claim it was on the leading edge with its report on harassment, although, as the report acknowledges, there has been previous scholarship on the problem. In particular, that scholarship has highlighted ineffectual efforts to prevent the problem from occurring, not just responding when it happens. Getting control of a dysfunctional organizational culture, well within the I-O bailiwick, has been picked up by attorneys in the advice they give corporate clients. Some commentators have called for “big picture” strategy that seeks to deal with cultures that may support forms of discrimination other than harassment, such as pay inequity.

The “big picture” approach is in contrast to criticism that has appeared in the legal and sociological literature, and was taken up by the EEOC report. The “small picture” approach¹ is seen as ascribing discrimination solely to “rogue” actors who act against the organization’s interests in their harassment. The organization’s response is limited to policy defining harassment as wrong and training on the policy, with procedures to report violations of that policy and thus limit the organization’s liability. Some advocates of cultural solutions would go so far as to make the organizations strictly liable for all harassment, whether management knew about it or not.

As mentioned in previous *Legal Front* articles, there seems to be fertile ground for both research and practice regarding harassment and lesser forms of negative treatment, termed microaggressions and microinequities. Dealing with these is not easy. What constitutes legally recognized harassment can be fuzzy, involving considerations of severity and persistence.² The microinequity concept further complicates the matter, because the perpetrator may be acting without malice or even awareness that the action is offensive.

The potential of psychology and allied sciences has percolated into business strategy discussions. A recent podcast (Güntner, Smith, & Sperling, 2018) mentions efforts at debiasing decision making; EEO bias is one area, but the broader context is dealing with biases in all organizational decision making. I-Os will readily notice here some of the biases that come up with conducting interviews and other assessments requiring human judgment. The approach advocated here is “nudging” people along the path to better decisions rather than heavy-handed policing of the workplace. That the bias issue might be framed in a wider context beyond EEO just might help to get it taken more seriously.

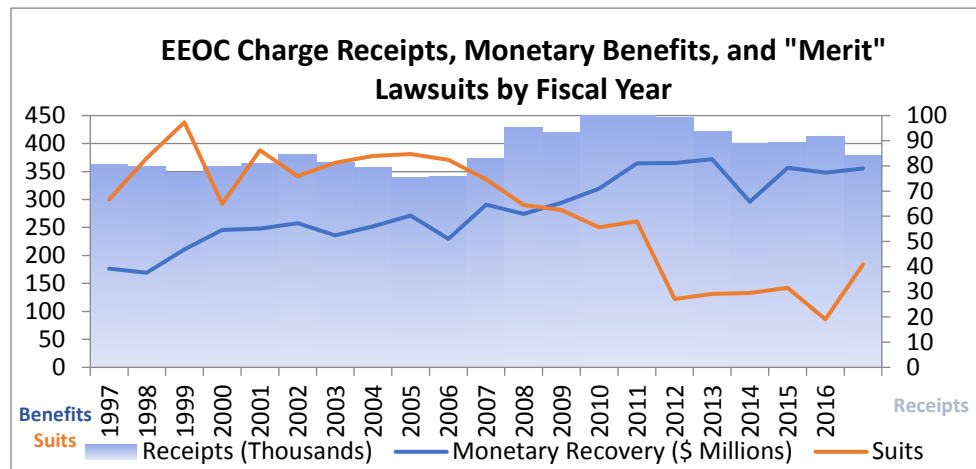
EEOC Sexual Harassment Charge Receipts By Fiscal Year								
Column1	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Receipts	7,944	7,809	7,571	7,256	6,862	6,822	6,758	6,696
No Reasonable Cause	4,551	4,975	4,842	4,066	3,662	3,770	4,019	4,206
	50.80%	54.10%	54.30%	52.40%	52.00%	51.70%	54.10%	56.00%
Reasonable Cause	779	696	676	532	426	398	420	432
	8.70%	7.60%	7.60%	6.90%	6.10%	5.50%	5.70%	5.80%

It has been noted that women have been deterred from filing discrimination complaints for fear of retaliation. Still, it is curious that sexual harassment charges received by EEOC have been in

decline, as has the percentage of “cause” findings. It remains to be seen if women now are more inclined to confront their harassers.³

Bad behavior outside Title VII time limits for filing a discrimination charge likely are not subject to other individual victim action. But an interesting side effect is suits filed by investors who take a loss because the stock of the implicated corporations falls; the allegation is that the boards of those corporations knew about the problem and did not discharge their duties to protect the corporation (Priol, 2018). Then there was the Trump Administration’s expected revolution, with much anticipation—both fear and hope—as to what was in store for EEO legal enforcement. The fear was that there would be a full-scale assault on disparate impact theory. The hope was that there would be less regulation seen as mindlessly burdensome, and the enforcement agencies would be less adventuresome in formulating new theories for hounding employers. The past year has little to show, either way. We had two federal agencies with opposing arguments as to whether discrimination based on sexual orientation constitutes sex discrimination under current law. There is more on this below. Meanwhile, EEOC awaits confirmation of two of the five commissioners, Janet Dhillon (Chair-designate) and Daniel Gade. Current Commissioner Chai Feldblum (Democrat) has been nominated for a second term. Democrats have a current 2-to-1 majority. There has been no nomination for General Counsel, the official who heads litigation against employers. One unsurprising development was suspension of plans to require salary information on the annual EEO-1 workforce demographics report. The Office of Management and Budget (OMB) called a halt because, as some employers have maintained since the proposal was announced, the reporting requirements may be unduly burdensome. Advocacy groups have sued, pointing out that OMB under the previous administration had approved the proposal. The Department of Justice (DOJ), defending the suspension, is arguing that no final action has been taken warranting judicial attention, and the groups do not have a claim to requiring the government to collect the data for them.

Nonetheless, there have been changes in EEOC activity, albeit not dramatic. For fiscal year (FY) 2017,⁴ compared to the previous FY, charge receipts were down to 84,259 from 91,503; “cause” findings were slightly down (2.9%), and “no cause” findings were slightly up (70.2%). “Merit” (substantive rather than procedural) suits filed by the agency were notably up (184 vs. 86); monetary benefits were up slightly, \$348.0M versus \$355.6M, excluding litigation benefits. Those were down, \$42.4M versus \$52.2M. As has been the trend in recent years, monetary relief is coming mostly from agreements, not litigation. The charge inventory was decreased by 99,109, to 61,621. Congressional critics had faulted the agency for too much focus on high-profile cases while the inventory was growing.



The Office of Federal Contract Compliance Programs (OFCCP) has a new director, announced without much fanfare. Ondray Harris had joined the administration last summer; he had been with DOJ during the previous Bush Administration. Notably, some

changes from the Obama Administration are still sticking regarding contractor employment rules: paid sick leave, affirmative action goals for military veterans and people with disabilities, nondiscrimination for LGBT people, and pay transparency. So far, there has not been much on addressing regulatory concerns from employers. Talk about combining OFCCP with EEOC has quieted, at least for now.

Probably the biggest changes have been with the National Labor Relations Board (NLRB), which likely has less impact on I-O practice than the activities of the EEO enforcement agencies. NLRB broke with precedent on several issues during the Obama Administration (Pedrow & Gordon, 2018); there is now restoration of the status quo ante on acceptance of "reasonable" settlements even if a party objects, a balancing test of the reasonableness of an employer's rules and worker's rights, allowing the employer to change workplace rules without agreement by the union if the change is consistent with past practice, overturning the establishment of "micro units" for unionization and overturning joint employer status based on potential joint control. Critics had seen this as a way to attach the parent company in disputes involving a franchise, even if the parent did not control the practices in question. But overturning this matter did not stick. Conflict of interest concerns were raised regarding former board member who participated in the overturning decision. The board then voted to return, at least temporarily, to the Obama-era policy. More change is likely. The board's General Counsel, Peter Robb, has issued a list of matters in which NLRB field offices should consult with headquarters rather than follow Obama-era precedents.

Another revolution, which some have started to suspect had stalled out, got some invigoration. The much-anticipated decision from the federal Second Circuit Court of Appeals (based in New York), whether Title VII covers employment discrimination based on sexual orientation as sex discrimination, was delivered on February 27. Previously, the Eleventh Circuit (based in Atlanta) said no; the Seventh Circuit (based in Chicago) initially said no, following court precedent on the matter. However, after this decision by a three-judge panel, the entire set of active and non-recused judges reheard the case en banc (legal French, the judges "on the bench") and overturned the precedent to yes. A similar scenario played out in New York, with the added drama of EEOC and DOJ being on opposite side of the question. In the end, the result also was similar to Chicago's: sexual orientation discrimination is sex discrimination.

The case (*Zarda v. Altitude Express, Inc.*, 2018) involves a skydiving instructor allegedly fired for being gay. He filed a discrimination suit but did not live to taste victory in this decision. His estate has been carrying on the litigation.

The vote was 10–3 for the decision, but the margin of the decision conceals marked disagreement on underlying legal theory. All of the judges, including the dissent, agreed that sexual orientation⁵ discrimination was wrong; the legal question was whether it was covered by law and by what rationale was it covered, because Title VII itself makes no reference to LGBT discrimination. The majority agreed on the proposition that sexual orientation discrimination by its nature had to involve sex discrimination, to some degree. But only five of the judges signed off on the opinion of the court, written by Chief Judge Katzmann. The others who concurred in the decision filed their own opinions regarding which portions of the court’s opinion they endorsed. The endorsement count seems to be as follows:

- Textual analysis over legislative history: Congress intended to put an end to sex discrimination, even though it did not foresee the specifics of sexual harassment, hostile work environment, and same-sex harassment. Sexual orientation discrimination fits as well. This argument was endorsed in the 5-judge plurality opinion of the court, 2 concurrences, and 1 who agreed with the general principle that sexual orientation discrimination was sex discrimination (and not with the other arguments), for a total of 8.
- Comparative test: If the person charging discrimination were of a different sex in the same situation, would there have been discrimination? If so, then sex must be a factor. This was endorsed by five judges. The court’s opinion indicated that this endorsement did not invalidate sex-based grooming standards or sex-segregated rest rooms.
- Gender stereotype: Sexual discrimination can involve enforcement of what the employer thinks is appropriate behavior for the sexes; sexual orientation can go against this expectation and so becomes the occasion for discrimination. This was endorsed by six judges.
- Associational discrimination: Discrimination can occur by association with someone on the basis of protected class. It would be racial discrimination against, say, a White person for association with a Black person; the employer has no problem with Whites but does not like Blacks or anybody who likes Blacks. The Seventh Circuit held that associational discrimination theory was applicable to all Title VII protected classes in its sexual orientation decision and eight judges agreed that it applied to sexual orientation here.
- Legislative developments: The five-judge plurality dealt with some objections by the dissent and found them unconvincing: Congress was aware that there were judicial decisions excluding Title VII coverage for sexual orientation when writing the Civil Rights Act of 1991 but did not include sexual orientation in the law; Congress has failed to pass a law specifically extending Title VII to sexual orientation although bills to the effect have been introduced many times; other laws differentiate issues of sexual orientation from sex.

Three judges joined in dissent, but here also there was disagreement. The main argument, put forth by Judge Lynch, was, “Discrimination against gay men and lesbians is wrong because it denies the dignity and equality of gay men and lesbians, and not because, in a purely formal sense, it can be said to treat men different from women.” He and two other dissenters argued that neither textual analysis nor legislative history supported inclusion of sexual orientation, that traditional associational bias had an element of bigotry not found in sexual orientation cases, and sex stereotyping is a separate issue from sexual orientation. He concluded with a differentiation between constitutional and statutory issues, which seems to be a response to a comment in EEOC’s brief that it was strange that two same-sex individuals could legally marry (established by the Supreme Court as a constitutional matter) but be fired from their jobs the next day for sexual orientation. Judge Lynch pointed out that the Constitution is concerned with broad, permanent principles of what the government can and cannot do to citizens; statutes deal with specifics that apply to how citizens interact with each other and can change with the times. The issue

here was that the statute did not change. The two other dissenting judges found this argument unnecessary and did not endorse it.

What next? One reaction was that, in the short, practical term, not much would change. Sexual orientation is protected in a majority of states and by many private employers, so discrimination is already banned there. For those that are discriminating, this ruling applies only to New York, Connecticut, and Rhode Island (which protect sexual orientation), and so it may be business as usual. There is clearly a circuit split on the issue, which is an invitation for the U.S. Supreme Court to intervene. But the Court likes to have the legal theories worked out in the lower courts before it issues the final word. The majority in this case seems to rally around the notion that sexual orientation discrimination logically involves sex discrimination, but after that one judge's rationale does not necessarily carry much weight with another judge. The dissent can point to the fact that various courts historically have given assurance that sexual orientation is not covered. Because Congress has shown no indication that it will provide a legislative resolution, the dispute falls back on the court, with the question being when will the time be ripe for a decision. There is also the matter of religious objection to employing gays and lesbians; this highlights that the issue is not a simple variation on sex discrimination.

Finally, the long-running revolt of the State of Texas (2018) against EEOC's 2012 guidance on criminal background history as a selection procedure got judicial resolution. Texas filed suit to prevent the agency from telling the state how to set qualifications for its jobs. EEOC, represented by DOJ, argued that its guidance was just guidance; there was no legal action pending against the state on the matter; and DOJ, not EEOC, had authority to sue the state for a Title VII violation. Texas responded by adding DOJ to the complaint and arguing that the "guidance" was an invitation for meritless private lawsuits. The court declined to grant the state's requests for restraints on EEOC enforcement, with one exception: EEOC and DOJ were enjoined from "enforcing the EEOC's interpretation of the Guidance against the State of Texas until the EEOC has complied with the notice and comment requirements under the APA [Administrative Procedures Act] for promulgating an enforceable substantive rule." As Shea (2018) noted, the injunction applies only to Texas and, although other defendants might want to cite to this decision, another court may rule that guidance really is just guidance and thus not subject to the APA. The bigger issue is the deference to be given to agency pronouncements on matters to which the law has not given specific regulatory authority. This has been a matter of controversy in recent years, with federal agencies issuing guidance and amicus curiae briefs (Latin, "friend of the court;" these are third-party opinions on how the law should be interpreted) that some have argued went beyond the law and sometimes contradicted the agencies' previous positions. Associate Attorney General Rachel Brand recently issued policy that DOJ litigators are not to use guidance material as presumptive indication of a legal violation (Tenpas, Etzel, Barker, & Nelson, 2018). On the other hand, presumably employers would want to know what an agency's position is regarding enforcement issues, such as EEOC's guidance on sexual harassment, awaiting OMB approval as of this writing (Gurrieri, 2018). Meanwhile, EEOC has to decide if it will mess with Texas on appeal.

Notes

¹ This is a simplistic description of a complex situation. For more extensive treatment, see, for example, Green (2017). Green also discusses a "cognitive bias revolution" heralded by the Implicit Associations Test. Some may question this revolution.

² Sperino and Thomas (2017) indicated that courts were ignoring blatant sexual harassment, relying on judicial doctrine on "severe" and "pervasive" not found in Title VII. Shea (2017) noted that sexual harassment itself is not found in Title VII and criticized Sperino and Thomas's views.

³ EEOC statistics in this article come from www.eeoc.gov/statistics. Besides what EEOC provides, see Maatman, DeGroff, Gagnon, & Miller (2017) for narrative and employer-side commentary on the statistics.

⁴ This covers October 1, 2016 to September 30, 2017.

⁵ The case was about sexual orientation, and so may be not fully apply to transgender matters. But the ink was hardly dry on the decision before the Sixth Circuit cited it in its ruling that gender identification was also covered by Title VII (*EEOC & Stephens*, 2018). The court held that “discrimination on the basis of transgender and transitioning status violates Title VII,” because “it is analytically impossible to fire an employee based on that employee’s status as a transgender person without being motivated, at least in part, by the employee’s sex.” In addition, “discrimination against transgender persons necessarily implicates Title VII’s proscriptions against sex stereotyping.” The three-judge panel also was unanimously unimpressed by the Religious Freedom Restoration Act (RFRA) defense that had worked with the district court, finding that “compliance with Title VII—without actually assisting or facilitating Stephens’s transition efforts—does not amount to an endorsement of Stephens’s views.” Also, “as a matter of law . . . a religious claimant cannot rely on customers’ presumed biases to establish a substantial burden under RFRA.” EEOC’s enforcement of Title VII was not an undue burden on religious expression. The court also disagreed with the district court’s finding that the actual substance of the complaint was a dispute over compliance with the employer’s dress code, noting that merely altering the dress code would not address the discrimination Stephens faced because she wanted to represent herself as a woman. Finally, the appellate court remanded back to district court the matter of whether there was discrimination regarding payment of a clothing allowance benefit available only to male employees.

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TIP-Topics for Students:

Do We Practice What We Preach? Maintaining Work–Life Balance as an I-O Graduate Student

Stefanie Gisler, Bradley Gray, Jenna-Lyn Roman, Ethan Rothstein
Baruch College and The Graduate Center, CUNY
Baruch College, CUNY

Keywords: work–life balance, work–life boundaries, work–life conflict, psychological detachment, recovery

One might think that graduate students in I-O psychology would be quite adept at achieving work–life balance. After all, researchers in this field have studied the subject for over 30 years (Greenhaus & Allen, 2011)! Furthermore, many I-O graduate students read about the work–life interface in their coursework and study it for their theses, dissertations, and collaborative research projects. Of course, having a theoretical understanding of work–life balance is one thing, but knowing how to implement those principles successfully is something else entirely. In reality, achieving work–life balance is often a struggle for graduate students, given the rigorous and unstructured nature of graduate schoolwork. Graduate students often need to juggle a variety of ongoing assignments and duties (e.g., extensive course readings, independent research, teaching). As a result, they may struggle to put down their work, which can make it difficult for them to enjoy their leisure time and take care of household responsibilities.

In this TIP-Topics column, we explore some of the most common challenges that graduate students in I-O Psychology face when it comes to achieving work–life balance, as well as some strategies that they can use in order to tackle these challenges head on. In order to shed light on these experiences, the TIP-Topics team surveyed current doctoral and master’s students in I-O Psychology. In the first part of the survey, students responded to quantitative items about their work schedules, overall levels of work–life balance and work–life conflict, and frequencies at which they engage in recovery experiences such as psychological detachment and relaxation. In the second part of the survey, they provided qualitative responses about the specific challenges that they face when it comes to achieving work–life balance, strategies that they have used to overcome these challenges, and how their graduate programs have supported them in this regard. The TIP-Topics team used content-coding in order to identify common themes in students’ responses. Throughout this column, we pull from both key insights from our survey and relevant findings in the literature.

Before we proceed, it should be noted that Aimee Kim and Kelsey Herb published a similar TIP-Topics column in 2012 about how I-O students can improve their work–life balance. The authors included a wealth of important information about the subject. In order to expand upon their work, we went directly to the source by gathering information about graduate students’ actual experiences.

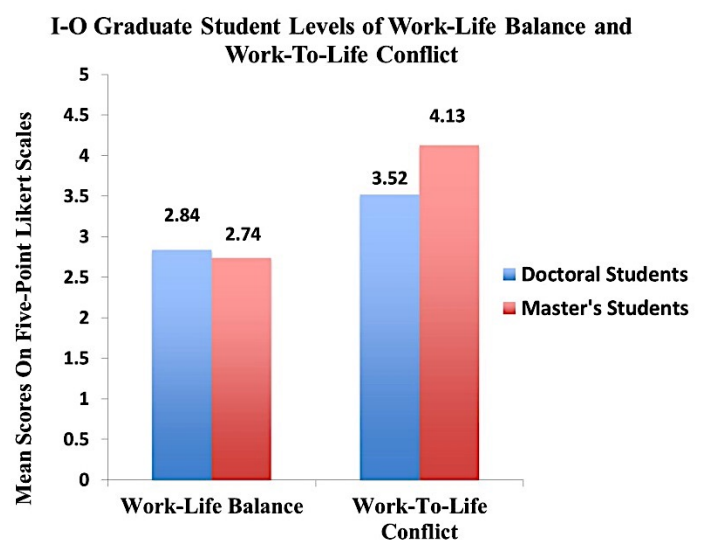
Breaking Down I-O Graduate Students’ Work Schedules and Work–life Balance

In order to recruit participants for our study, we contacted faculty members from more than 20 graduate programs in industrial-organizational psychology, social-organizational psychology, and organizational psychology. Faculty then forwarded the survey link onto their students, many of whom decided to participate. Our final sample consisted of 79 doctoral and 42 master’s students. Both samples were majority female (62.7% for the doctoral students and 61.5% for master’s). We asked participants to report the number of hours per week that they typically spent on work for graduate school (e.g., course readings, research commitments, teaching requirements). The mean for doctoral students was 49.4 hours per week ($SD = 14.9$), and the mean for master’s students was 35.4 hours per week ($SD = 13.1$). These are quite substantial workloads, as 49.3 hours amounts to slightly more than 6 traditional workdays and

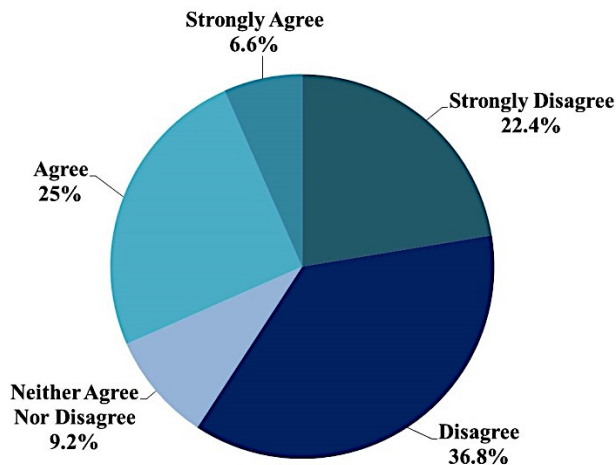
35.4 hours amounts to about 4 and a half. Results also demonstrated that graduate students accomplished a significant amount of their school work outside of typical business hours (9am-5pm, Monday-Friday). For hours worked during weekday evenings, the means were 9.47 for doctoral students ($SD = 7.08$) and 12.9 for master's students ($SD = 8.76$). For hours worked during weekends, the means were 8.76 for doctoral students ($SD = 4.34$) and 12.5 for master's students ($SD = 5.16$).

In order to quantify the extent to which students' intensive workloads affected their lives outside of school, we measured their overall perceptions of work-life balance and work-to-life conflict. Work-life balance was measured with four items adapted from the Work-Life Balance Scale (Brough et al., 2014). A sample item was "overall, I believe that my work life and nonwork life are balanced." Participants were instructed to only consider their graduate school work when they responded to these items. Work-to-life conflict was measured with four items adapted from the Work-Family Conflict Scale (Carlson, Kacmar, & Williams, 2000). A sample item was "I have to forgo things that I enjoy due to the amount of time I must spend on graduate school responsibilities." Both scales were scored on a Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Consistent with our expectations, we found that both groups of students reported fairly high levels of work-life conflict ($M = 3.52$, $SD = 1.08$ for doctoral students and $M = 4.13$, $SD = 0.77$ for master's students). Similarly, both groups reported fairly low levels of work-life balance ($M = 2.84$, $SD = 0.70$ for doctoral students and $M = 2.74$, $SD = 0.64$ for master's students).

Included in this column you will find a bar graph with the mean scores for work-life balance and work-to-life conflict for both doctoral and master's students, as well as a pie chart that shows the response breakdown for the work-life balance sample item, spanning across both doctoral and master's students. Specifically, the pie chart demonstrates what percentage of graduate students responded "strongly agree," "agree," "neither agree nor disagree," "disagree," and "strongly disagree" to the item "overall, I believe that my work life and nonwork life are balanced."



I-O Graduate Student Responses to Work-Life Balance Item
“Overall, I believe that my work life and non-work life
are balanced.”



Specific Challenges in Achieving Work-Life Balance

Overall, quantitative results suggested that both doctoral and master's students have difficulties balancing their school responsibilities with their life activities and commitments. In order to probe deeper into the reasons why this can be such a significant challenge, we coded participants' responses to qualitative items. We found that the majority of students' work-life issues could be categorized by one of four broad themes: weak temporal boundaries separating work and home, weak spatial

boundaries, low psychological detachment from work, and difficulties balancing graduate school with romantic relationships. In the following sections we elaborate on each of these issues, describe strategies that students can implement for each, and provide suggestions for how graduate programs can provide assistance.

Weak Temporal Boundaries Separating Work and Home

The vast majority of students mentioned that the general lack of structure in their school schedules made it hard for them to separate their work lives from their home lives. Whereas in most jobs it is clear as to when the workday begins and ends, such clarity is rare in graduate school. Apart from courses, teaching obligations, and lab and program meetings, there are few times each week that are officially designated for work. One might think that having this level of scheduling flexibility can be a good thing. After all, job autonomy is linked to a variety of positive outcomes, both at work and at home. However, many of the students that we surveyed indicated this flexibility was an encumbrance because it made it more challenging for them to separate the workday from the "home day." When there is not a clear demarcation of what constitutes work hours and nonwork hours, work-life boundaries become more "permeable" (Clark, 2000; Desrochers & Sargent, 2004; Edwards & Rothbard, 2000). This makes it easier for people to devote more of their time to either work or home responsibilities, which can weaken work-life balance (Greenhaus & Allen, 2011).

Many of the students that we sampled mentioned that their scheduling flexibility simply made it feel as though every hour of the day was part of the workday. As a result, many students indicated that they checked and responded to emails right up until the time they went to sleep, which took away time from leisure and household responsibilities. Others noted that they could not afford to make plans with friends and family on weekends because there was always something else that they needed to work on. Several also mentioned that not having a set workday made it difficult for them to maintain a healthy lifestyle. For example, many often chose to forego sleep, exercise, and cooking because they felt that time was really meant for reading articles or working on their independent research.

Graduate students who face these issues may be able to improve their work–life balance by creating a clear boundary between work time and nonwork time. Some students provided great recommendations for how to go about this. For example, several mentioned that they create their own “set” work hours, so that they need to put down their work once those hours are up. Others indicated that while they are not quite as strict with their work overall, they refuse to check their email after 5 or 6pm. Faculty members can also help their students by sending them fewer emails in the evenings and on weekends. This could make a significant difference, as many students noted that their advisors expected them to answer emails at all hours and make themselves available at a moment’s notice. Another useful suggestion was to wake up on the early side, so that one could have ample time to do work during the day and relax at night. Many also mentioned that each week they strive to make either Saturday or Sunday an entirely work-free day.

Weak *Spatial* Boundaries Separating Work and Home

Along the same lines, many students indicated that their issues with work–life balance stemmed from weak spatial boundaries between work and home. This is quite sensible, given that graduate students generally do a significant amount of their work at home. Research suggests that when people work from home, there can sometimes be a lack of clarity between what constitutes one’s home space versus one’s work space. Such permeable spatial boundaries can make it more likely that stressors originating in one domain will spill over into the other (Clark, 2000; Desrochers & Sargent, 2004; Edwards & Rothbard, 2000). When stressors from either the work or family domain interfere with functioning in the other domain, the result is role conflict. Such conflicts can threaten one’s ability to maintain work–life balance (Greenhaus & Allen, 2011).

We found somewhat similar patterns in our graduate student sample. On average, we found that doctoral students completed 44.7% of their work at home and 43.4% of it on campus. The percentages for master’s students were nearly identical, as on average they completed 42.8% at home and 43.0% on campus. This even split between home and campus is promising, because it suggests that there are at least some spatial boundaries. Nevertheless, this is still a significant amount of “homework,” and many of the students we surveyed mentioned several ways that this negatively impacted their work–life balance. For example, some indicated that there were many distractions at home that made it difficult to focus on work, such as chores that needed to get done, the television remote being an arm’s length away, and roommates or significant others relaxing on the couch after completing their day at work when the graduate student has a paper due the next day. Others mentioned that their home simply felt like another office space, which made it difficult for them to put down their work and enjoy their leisure time. This also made it seem as though the people they lived with were encroaching upon their work-space, which made their work more stressful and occasionally led to them taking this stress out on those around them.

In order to circumvent some of these issues, students noted that they could create designated workspaces in their apartments or homes or spend more time doing work in coffee shops, libraries, and on campus. Another good idea would be to be straightforward with roommates, significant others, and family members about the need to use the home as a workspace. When there is a respectful agreement, this can benefit both parties. Finally, graduate programs can do a better job of providing their students with designated workspaces on campus. Although nearly every doctoral student had such an arrangement, few master’s students did.

Difficulties With Psychological Detachment

Another common issue was that even when students were engaged in nonwork activities, they could not take their minds off of their work. In the literature, we might refer to this as a lack of psychological detachment. Psychological detachment from work refers to the extent to which one mentally disengages from work during off time (Sonnentag & Fritz, 2007). This can be particularly important for graduate students, who face a multitude of work demands day in and day out. If they are unable to psychologically detach from work, then these demands will continue to strain students' well-being and make it difficult for them to enjoy their nonwork time. Many students mentioned that it was difficult for them to be fully engaged in activities with friends and family because they could not stop thinking about the many work assignments that were on the horizon. Others even reported that they felt guilty when they decided to relax because of a perceived obligation to spend that time reading for classes or making progress on research. We also measured students' levels of psychological detachment, using the psychological recovery scale (Sonnentag & Fritz, 2007). The results were consistent with students' qualitative responses. Mean scores on the five-point Likert scale (with higher scores indicating more frequent detachment) were fairly low, at 2.36 for doctoral students ($SD = 0.74$) and 1.93 for master's students ($SD = 0.61$).

This can be a difficult problem to address, as changing one's mental habits is not an easy task. However, there are some useful strategies. For example, exercising, doing yoga, and practicing mindfulness can help clear one's head and break free from graduate school thoughts. Although these were the most commonly used strategies, students can also psychologically detach by spending their leisure time on activities that are particularly engaging or mentally stimulating (e.g., hobbies, new challenges). These types of activities can help students recharge their batteries without letting work thoughts creep in. Another strategy is to simply take short breaks throughout the day in order to periodically clear one's mind from work.

Graduate School and Romantic Relationships

Last, many students brought up challenges related to being in a romantic relationship while in graduate school. The majority of students in our sample (64%) were currently in a romantic relationship. Most of these issues seemed to stem from students having drastically different work schedules than their romantic partners. For example, many students noted that if their partners worked standard full-time jobs, there was an added pressure for them to get their work done during those hours. There was often an expectation that once their partner got home, the workday was over and the remaining time was meant to be spent together. Several students suggested that this pressure was actually beneficial, as it forced them to create a set work schedule for the week (which helped improve spatial work-life boundaries). However, others noted that their partners' expectations were simply unrealistic, because they often needed to work during the evenings in order to stay on track. This could place strain on the relationship. A related issue was that students felt that their partners had very little idea what it was like to be a graduate student. Evidently, some partners believed that graduate students had tons of free time on their hands, because class time takes up such a small fraction of the week. Others apparently did not realize how challenging and time intensive research projects can be. Many noted that these types of misconceptions were disrespectful and led to arguments about whether one was prioritizing work over the relationship. Although there is no "correct" way to handle such issues, having honest conversations can go a long way. Graduate students can be forthright about their workloads and work schedules, and make it clear that at least on occasion they will need to work in the evening. However, they can also make concerted efforts to synchronize their schedules with those of their partners.

Furthermore, some students lamented that because they had the ability to work from home on a regular basis, they were often expected to handle the lion's share of household duties (e.g., laundry, dishes, pet care). Again, being forthright can go a long way. Having an honest dialogue about why this is frustrating may lead to a more equitable distribution of chores.

Conclusion

The common threads in this survey revealed that many doctoral and master's students in I-O psychology share concerns about the state of their work-life balance. Our survey revealed that both doctoral and master's students in I-O psychology report fairly low levels of work-life balance and high levels of work-life conflict. We found that many of these work-life issues stem from unclear temporal and spatial boundaries between work and home, difficulty psychologically detaching from work, and trouble balancing graduate school with romantic relationships. Although there is no doubt that these are significant challenges, so many of the surveyed students offered clear, clever, and optimistic insights about how to combat the difficulties that they face. We hope that by being forthright about these work-life conflicts, we can foster open discussion about strategies that can be implemented on the individual and institutional levels. Conversations like these can provide I-O students with a sense of camaraderie and resolve. We are in a unique position to confront our struggles from an insider's perspective given the nature of our academic studies. Our work-life problems may be difficult, but we have the tools and wherewithal to solve them together.

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Stefanie Gisler is a PhD student at Baruch College and The Graduate Center, CUNY. She received her BA from Bucknell University and an MS in I-O Psychology from the University of Central Florida (UCF). Her research interests include occupational health psychology, diversity, and selection. After earning her PhD, Stefanie would like to pursue a career in academia.

Bradley Gray is a PhD student at Baruch College and The Graduate Center, CUNY. He obtained a BA in Psychology from Wake Forest University in 2010 and an MA in Clinical Psychology from Towson University in 2012. He researches occupational health psychology, with an interest in the relationship between supervisors and their employees, and is also interested in culture change and executive development.

Jenna-Lyn Roman

Jenna-Lyn is an MS student at Baruch College, CUNY. She received her BA in Psychology from the University of South Florida. She is interested in work–family research with an emphasis on nontraditional workers and understudied populations (i.e., military families), and gender parity topics. She is currently completing her thesis at Baruch and looking forward to beginning an I-O PhD program in August 2018. Jenna would like to be a university professor specializing in work–family topics.

Ethan Rothstein is a PhD student at Baruch College and The Graduate Center, CUNY. Ethan obtained his BA in Clinical Psychology from Tufts University in 2013. His primary area of research has been the interface between work and family, but he has also conducted research on motivation, leadership, team processes, and occupational health psychology. After he graduates, Ethan would like to pursue an applied career in both consulting and industry.

The TIP-TOPics team can be reached by email at erothstein@gradcenter.cuny.edu

Crash Course in I-O Technology: A Crash Course in Blockchain

Richard N. Landers and Andrew B. Collmus
Old Dominion University

Blockchain seems to be all the techno-rage these days. It is the technology underlying the cryptocurrency Bitcoin and the many altcoins that have come after it, such as Bitcoin Cash, Litecoin, and Ethereum. Blockchain is poised to “disrupt” several industries, and consultancies like Deloitte claim that [HR disruption is ahead](#).

To understand what might be disrupted and if I-O psychology should care, we need to dig a bit into what exactly blockchain is, what it does, and what potential it offers. The best way to understand a technology is to recreate it yourself—think about how many years ago you learned ANOVA by creating a summary table by hand—so in this article, we will create a small blockchain using R to illustrate just how simple the basic concept is. But first, let’s walk through it with words.

A blockchain is, at its core, a digital ledger. In most cases, these ledgers are public and available on the Internet. Each blockchain is a list of permanent and secure information that you want to keep and add to over time. Each of these groupings of information is a “block.” In the case of cryptocurrencies, blocks contain information about transactions. For example, a Bitcoin ledger contains, among other things, a list of sale amounts, buyer IDs, and seller IDs. Each time a new transaction is added to the Bitcoin ledger, the ledger grows by one block, and blocks can never be removed. Thus: block-chain.

If you’re wondering why permanent public digital ledgers would be useful, it is most obvious in the case of cryptocurrencies, which is why we hear so much about them these days. There are three major advantages. First, because buyer IDs and seller IDs are encrypted, money can change hands without the identities of the buyer and seller becoming public. In other words, I know that “user 123” made a purchase from “user 456,” but I have no immediate way to determine who 123 and 456 actually are. However, if john@iopsych.com comes to me and says “I am user 456,” I can verify this easily by encrypting “john@iopsych.com”. If my encryption turns up “456,” I have verified this person’s claim.

Second, because the ledger is public and on the Internet, there is no need for middlemen, which is a major issue in the financial sector. If you have ever tried to send money over state lines, or worse, international borders, you might have noticed that there were a surprising number of organizations involved. For example, if I want to send money from the United States to a friend in Germany, I can’t simply “send money.” Instead, I would probably need to initiate a wire transfer, which typically carries fees and involves companies called “brokerage houses.” The most common of these is Western Union. That means if I want to send money to my friend, information must be collected, verified, and processed by me, my bank, the brokerage house, my friend’s bank, and then my friend: a minimum of five distinct steps are involved. The transactions between each of us and our bank, and between each bank and the brokerage house, are all under a complex system of local, regional, national, and international laws. By using a cryptocurrency, you can bypass literally all of that. At least for now.

Third, because the ledger is public, it can be verified and tracked by an unlimited number of people and organizations at any given moment. If someone tries to change an early block in the chain, the entire remainder of the blockchain is suddenly incorrect.

This combination of security, anonymity, and speed is what has made cryptocurrencies enormously popular, because these three characteristics are all quite valuable for financial transactions. But can blockchain, the technology that enables cryptocurrencies to even exist, benefit HR and I-O? To understand this, let's first look at blockchain in action.

Let's See It in Action

As described earlier, the best way to understand blockchain is to create one. It's not as difficult as it might seem! Creating a blockchain fundamentally only requires two actions: the creation and encryption of blocks. We'll do this in R.

First, let's ensure we have the library we need, which we will use for encryption.

```
library(digest)
```

Next, let's create a sample block so that we can see what goes inside:

```
starter_block = list(
  index=0,
  timestamp=Sys.time(),
  data="important information for first block",
  prior_hash="genesis",
  next_hash=NULL
)
```

This block is coded as a list object that contains five pieces of information. The index simply counts which block we're on, starting at zero. The timestamp records when the item was added to the ledger. Data contains whatever it is we want to track.

The next two items, *prior_hash* and *next_hash* are the key to blockchain. A hash is the result of encryption. There are numerous algorithms available to convert literally any piece of data into a cryptographic hash, and the better the algorithm you use, the more difficult it will be to reverse engineer the hash to produce whatever created it. For example, try this in the R Console:

```
sha1("Encrypt me!")
```

You should see the following output:

```
2a2419070644fecacab078ebf1c6c92408e1baef
```

The fact that you and I and everyone else get exactly the same answer is the key to hashing; there is (theoretically) only thing that will produce that precise hash (i.e., a string containing the text, "Encrypt me!"), it took very little time to create the hash, and it's very difficult to go in the reverse direction (i.e., from the hash back to "Encrypt me!"). Thus, good hashes are easy to create, easy to verify, but difficult to reverse engineer.

The hashing algorithm we just used is called SHA-1, which stands for *Secure Hash Algorithm 1*. These days, SHA-1 is not considered secure, because computing power has increased so dramatically over the past few years that SHA-1 can be reverse engineered in a reasonable amount of time with a sufficiently powerful computer. Thus, modern cryptography typically uses some variant of SHA-2, which comes in 224, 256, 384, and 512-bit varieties. The most common of these is SHA-256:

```
digest("Encrypt me!", "sha256")
```

When you run that, you'll see that the output hash is much longer. In fact, due to its length, that hash has 2^{256} possible values. Thus, it is incredibly unlikely that *any* two strings, any two pictures, any two audio clips, any two videos, or any two anything, after being hashed, would produce the same SHA-256 hash. This translates into higher security, because it is extraordinarily difficult to reverse engineer the original data from which a SHA-256 hash is created (with modern computers).

Given this, the security advantages of blockchain come from the fact that each new block is hashed along with all previous blocks, and each new hash is stored inside each new block as it is created. Thus, if you change the information contained within an early block, all the hashes that come after it will suddenly be incorrect. This prevents people from attempting to rewrite the past within the ledger, because it will be immediately obvious to everyone else watching the ledger that something has changed that should not have been changed.

To illustrate, we will create two functions. First, we need a function that hashes a block. In the function below, we apply the SHA-256 hashing algorithm to the information contained within a block, then return the hash it creates.

```
create_block_hash = function(block) {  
  to_be_hashed = list(  
    block$index,  
    block$timestamp,  
    block$data,  
    block$prior_hash  
  )  
  next_hash = digest(to_be_hashed, "sha256")  
  return(next_hash)  
}
```

As you can see, the function takes a block as input, then it hashes four of the pieces of information within that block, returning that hash as the output of the function.

Next, we write the function to create a new block based upon that hash:

```
create_new_block = function(prior_block, data_for_new_block) {  
  new_block = list(index = prior_block$index + 1,  
    timestamp = Sys.time(),  
    data=data_for_new_block,  
    prior_hash=prior_block$next_hash  
  )  
  new_block$next_hash = create_block_hash(new_block)  
  return(new_block)  
}
```

In this function, the previous block in the blockchain plus the new data are used as input to create a new block. Then, this data is hashed using the first function I wrote above and included as part of the new block. That means the block now contains unencrypted data plus an encrypted hash of those data.

That's it! We have the two functions necessary to create a blockchain. To illustrate what's happening in these two functions, try hashing the starter block we created earlier:

```
starter_block$next_hash = create_block_hash(starter_block)
starter_block
```

When you run this code, you'll see that the `starter_block` list now contains a "next hash," which is a SHA-256 encryption of itself. We can start our blockchain with this newly encrypted block like so:

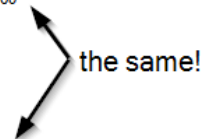
```
blockchain = list(starter_block)
```

and we can add new blocks to the blockchain directly:

```
blockchain[[2]] = create_new_block(blockchain[[1]], "new info for block 2")
blockchain[[3]] = create_new_block(blockchain[[2]], "new info for block 3")
blockchain[[4]] = create_new_block(blockchain[[3]], "new info for block 4")
```

In a "real" blockchain, to be used in the real world, we would want to create code to add blocks like this automatically, based upon requests from the people watching the blockchain ledger. But for our toy example here, that just adds unnecessary complexity and is something we can leave to professional software engineers.

[[3]]	list [5]	List of length 5	
index	double [1]	2	
timestamp	double (S3: POSIXct, POSIXt)	2018-03-04 13:34:50	
data	character [1]	'new info for third block'	
prior_hash	character [1]	'fc27963ce86861ca00e7cc5dcb2725063f88bfbbe817c08d59822347a266add6'	
next_hash	character [1]	'9c648cd89c1216f93d2ef57184504db545eae7ba4ab9135ecd10ce620b4e6860'	
[[4]]	list [5]	List of length 5	
index	double [1]	3	
timestamp	double (S3: POSIXct, POSIXt)	2018-03-04 13:34:51	
data	character [1]	'new info for third block'	
prior_hash	character [1]	'9c648cd89c1216f93d2ef57184504db545eae7ba4ab9135ecd10ce620b4e6860'	
next_hash	character [1]	'9f412e14c82cb09f99e35604385be9b502d434a959bb53eee66014e05b9de6db'	



You can see the outcome of the hashing algorithm by looking at the content of our four-piece blockchain. Within each block, the `next_hash` character vector gives a SHA-256 hash that is also the SHA-256 hash contained in the `prior_hash` vector of the next block.

Put in programming terms, two relationships are therefore always true for any two sequential blocks within the chain:

1. `blockchain[[i]]$next_hash == blockchain[[i+1]]$prior_hash`
2. `blockchain[[i+1]]$prior_hash == create_block_hash(blockchain[[i]])`

By building a chain of blocks where these two equalities are always true, all blocks within that chain are linked together in a permanent sequence. If any block is removed or changed, the hashes will no longer be accurate, and this is immediately obvious to anyone watching the ledger; that's what maintains the security of the blockchain.

To Learn More

The R code I wrote to create a blockchain here is a simplified version of Datacamp's [exploration of blockchain in R](#), so if you want to dig just a little deeper, or if you want to [see the same ideas in Python](#), I would recommend starting with one of those. Once you have a better handle on the core idea, you might look at something like [Hyperledger](#), which is a complete framework for creating your own blockchain and adds a lot of features that don't exist in our toy blockchain, like proof of work, decentralization, and a management layer.

Having said that, frankly, I-O psychologists are never going to need to create a *functional production-quality blockchain* except to satisfy personal curiosity, so for the average I-O, the toy blockchain presented here is plenty to play around with. Once you have a handle on the idea of a public-facing ledger that contains permanent data records and encrypts previous versions of itself as it is built over time, you have the core of the idea. The remaining issue to explore is where this idea might be useful.

Conclusion

Understanding where blockchain could be applied to I-O and HR more broadly is right now the million-dollar question (literally). There are a host of startups attempting to take advantage of this new technology to improve HR.

We reached out to many I-O, HR and business leaders to get a better feel for what type of questions and requests are being made regarding the use of blockchain in talent management. The majority of our respondents were unwilling to share or had not yet been approached with such questions. However, the head of an advanced analytics department in a large technology firm who wished to remain anonymous offered the following:

Blockchain has great potential in HR to speed up the delivery of employee information through the systems. Examples would be having all of your medical plans attached to your medical history within blockchain such that you can give your doctor the encrypt key any time and they would have a full history of you.

Blockchain could easily help in the onboarding/validation of new employees. Imagine if all of your employee docs and required paperwork were on blockchain. The amount of time saved from an HR onboarder to go find all relevant information would be dramatically faster than having to call around to each place to verify documents and history of employment.

Blockchain could eventually impact people in job search and recruiting. If a user has resume on blockchain, it's verified already and makes the search and hire process faster.

The most obvious and likely the first to happen will be an employee payment going through blockchain. This could save significant time and cost around all the 3rd party payers for companies. This would be beneficial for full time, part time, and contract workers.

It could also be an electronic replacement for those countries that need to have a paper copy of certain things for record. If those all switched to blockchain that is secure and distributed, there would be no need to create all the paper trail, storage facilities, and people to manage that paperwork.

And lastly, it will enable better security and relevance in areas like EMEA and beyond which have much stricter laws around global data privacy regulations.

[Deloitte identified several use cases for blockchain in HR](#). Some of these are more relevant to I-O than others. One use case was payroll. Specifically, because many organizations are multinational entities, the process of paying their employees must move through several intermediaries as mentioned earlier in this article. However, because international money markets are volatile, some intermediaries take advantage of exchange-rate fluctuations to profit by optimizing the timing of payouts. Thus, in addition to cutting out the middleman, blockchain can be used here to lock in a specific and verifiable exchange rate, leading to greater transparency and efficiency in the exchange. This is probably the biggest and most obvious advantage to blockchain in HR, although it is not particularly relevant to I-O.

Another HR use case identified by Deloitte was credential certification. Because job applicants will sometimes fudge or outright lie in application materials, blockchain could be used to create and store verifiable histories of credentials, such as GPA and degree earned from a university, background check status, or any other information used to make personnel decisions. In I-O terms, this ideally increases the validity of (verifiable but often unverified) application materials and employment records. Biodata, in particular, would benefit from blockchain.

A third use-case extended the idea of credential verification to include all types of HRIS information, including home addresses and medical records. Thus, anyone needing this information and given the key could access that information immediately without the need for technological middlemen. This is attractive due to the difficulty in reverse engineering modern encryption; theoretically, the people who should have access to the data can get access very easily, and the people that shouldn't, can't. However, it should be noted that today's "secure encryption" is tomorrow's data breach, so organizations and HR departments would do well to exercise caution when dealing with confidential data regardless of the level of encryption. Traditional data security practices are unlikely to disappear, but they are likely to change shape. For I-O, the greatest advantage to blockchain of this type would be a more consistent way to access HR information when needed; anyone who has tried to integrate data from multiple HR data systems and thought, "Why does this have to be so difficult?" has already wished for blockchain without realizing it.

In summary, blockchain is a popular new technology that allows for decentralized, encrypted, and verifiable exchange of information. Each new block takes the existing information including an encrypted

hash of that information, adds new information and a timestamp, then encrypts it all again before sending to the next block. As the latest buzzword in technology, blockchain will certainly be brought up to I-O practitioners as organizations and HR departments follow trends and strive for competitive advantage. We've identified some potential use-cases for HR. As with all new technologies, it is important to consider whether blockchain is necessary and actually adds value to an existing process. There will undoubtedly be new products, vendors, and services peddling blockchain in HR. We hope that with an increased understanding of what blockchain is and how it might be used, our readership is better able to navigate these claims and differentiate between innovative useful products and those capitalizing on buzz.

That's it for the eighth edition of *Crash Course*! If you have any questions, suggestions, or recommendations regarding blockchain or *Crash Course*, Richard would love to hear from you (rnlanders@tntlab.org; @rnlanders). If you have questions about blockchain in particular, my guest coauthor this week, Andrew Collmus, would be particularly happy to help (acollmus@odu.edu; @AndrewCollmus).

So You Have Tenure: What Comes Next?

Allison S. Gabriel
University of Arizona

Chu-Hsiang (Daisy) Chang
Michigan State University

Russell E. Johnson
Michigan State University

Christopher C. Rosen
University of Arkansas

After focusing on nothing but researching and teaching since entering the tenure track, one of the fun pieces—I hope—posttenure will be figuring out how to shift my time around. Part of this shift will ideally be to regain a bit of work-life balance that has vanished since I started my PhD program 10 (!) years ago. I admit that this vanishing act was intentional, and I created it because I love my job, and that means work doesn't always feel like "work." However, I recently read [this article](#) by Katerina Bodovski on *The Chronicle of Higher Education* entitled "Why I Collapsed on the Job," and many of the points hit home and fit with my own struggles that I have detailed [here](#). So, goal #1 posttenure is going to be making small changes that add up in a big way: trying to minimize the amount of e-mailing/working I do on the weekends, leaving work at work as much as possible during the week, and maybe (just maybe) leaving my work computer at home whenever we leave Tucson for more than a day. Of course, as Mike and I have talked about these shifts we both want to make (he's an academic, too, teaching math at UA), we know that there will be exceptions when deadlines and exams come up. But, we both have agreed that the "life" part of work-life balance needs to roll more to the forefront.

Besides rebalancing things, the other conversation that is dominating our household these days is: What comes next? Although we've talked a lot about new classes I might like to teach or how I want to change my approach to PhD advising, the one piece that is entirely new compared to discussions pretenure is what types of service outside of UA I see myself getting involved in. I've been fortunate to have some really positive service-related experiences as a junior faculty member, from co-coordinating the PhD program at UA with **Nathan Podsakoff**, to being on a few journal editorial boards, and, more recently, to becoming increasingly involved at AOM and SIOP. But, despite these experiences, there is a lot of uncharted territory out there. Rather than guess about what it might be like to try different service roles, I reached out to three friends and fellow Akron alumni—**Daisy Chang**, **Russ Johnson**, and **Chris Rosen**—to talk about working for NSF, editing at top journals, and entering leadership tracks in our professional organizations.

Daisy Chang: On Becoming a Program Director at NSF

One of the major benefits of being posttenure is that it gives you more autonomy to pursue projects and engage in roles that you are interested in. In my case, I was looking to do something new and challenging. I have been researching and teaching since I started graduate school in 2000, and I felt like I was in a cycle dictated by academic calendars, conference dates, and other deadlines for submissions and revisions. Don't get me wrong, I still very much enjoy interacting with my students, battling the reviewers, and having the summers off. But I was looking to expand my horizon a little bit. This is when the opportunity to take on the program director role at the National Science Foundation (NSF) presented itself. I have been a

reviewer for various funding agencies before this, and it always intrigued me as to how funding decisions were made beyond the reviewers' scores. This was a great chance for me to learn something new in a university-like environment, with the added benefits of living in the Washington DC area.

Having been serving as a program director for a year and half now, I can say that this job is really everything that I thought it would be, plus a little more. I would say that there are three main things that I learned or was reminded of as a result of being a program director. First and foremost, there are so many cool topics to study within the realm of organizational science, and there are so many different ways to study these topics too. When I-O psychologists think about organizational science, we think about issues related to the "I" and the "O" side, and we are armed with our typical research methodologies of surveys, experiments, and observations. But there are many other topics that can be studied, and with the technological advancement, many different ways to gather and analyze data. The best part about my job is to read through proposals submitted by investigators from different fields and to learn about how they approach the diverse research problems related to organizational science. A second thing that I have been reminded of is the importance of knowing your audience. Different funding agencies have different interests and priorities. A successful proposal needs to not only be grounded on solid science but also be written in a way that addresses the funding agency's needs. Finally, I appreciate my colleagues and fellow program directors at the NSF very much. I am surrounded by scholars from different disciplines and have different perspectives on the same issue. It's fun to have conversations and debates and learn about how economists or political scientists or sociologists approach the same problem. As I wrap up my rotation at NSF, I am excited to take these new insights back to my home department to share with my colleagues and students. I am also excited to start new research projects that apply some of the new skills that I learned.

Russ Johnson: On Becoming an Associate Editor at *AMR* and *JBP*

With tenure comes the possibility of many new adventures, one of which is serving as an associate editor. Unlike pretenure, when all of your time and effort really ought to be devoted to pushing your own research out, expectations for service and "giving back" to the academic community take on a bigger role for tenured faculty. Initially, the way I gave back was mostly by reviewing for journals, first as an ad hoc reviewer and then as a board member. However, after consistently reviewing for a journal (and providing timely and constructive reviews!), you may be invited to join the associate editor team at that journal, which I was fortunate to experience at *Journal of Business and Psychology* and *Academy of Management Review*. Although receiving that invitation is an honor, it can also precipitate thoughts of "What the heck am I getting myself into if I say 'yes' to this?" I thought I'd share what I see as some of the key challenges and benefits of being an associate editor (I'll start with the challenges to end on a positive note!).

Without a doubt, the biggest challenge is the time commitment. Serving as an associate editor at a major journal means you could be handling anywhere from 30 to 60 (or more!) new submissions per year, plus whatever revise-and-resubmit papers are in your pipeline. Factoring in the time it takes to process submissions (e.g., reading manuscripts, assigning reviewers, integrating reviewer comments, writing decision letters, etc.), I would spend about one day per week on my associate editor duties. That's a lot of time, especially considering you still have to teach, mentor students, and make progress on your own research! Another challenge is making the switch from a reviewer mindset to an editor mindset. As a reviewer, the mindset tends to be negative and prevention oriented (e.g., identifying a study's problems and reasons for rejecting it), whereas an associate editor's mindset must be more constructive and promotion oriented (e.g., identifying a study's strengths and feasible ways to redress problems). After years of judiciously searching for a study's problems and limitations as a graduate student in seminars and then as an ad hoc reviewer and board member, it required no small effort to overcome this prevention-oriented inclination and make the needed switch to a developmental mindset.

So why succumb yourself to the time and effort demands of being an associate editor? Well, doing so provides plenty of benefits. For one, it gives you the opportunity to have a direct and meaningful impact during the review process by deciding whether and how a submission should be revised. As a reviewer, there were several instances where I thought rejected submissions had high potential, but I lacked the decision-making authority to give the authors a second chance. As an associate editor, you get to make that call! Another benefit is, after dealing with numerous submissions, you develop a much better sense of effective (and ineffective) strategies for problematizing research questions, articulating contributions, and conducting comprehensive analyses. As a result, my own writing and responses to reviewer comments have improved tremendously. Other benefits include broadening your knowledge when you handle manuscripts outside your primary areas of expertise and gaining further insight into the publication process and what goes on “behind the scenes.” In short, serving as an associate editor was a rewarding (albeit challenging) endeavor that involved new responsibilities and different skill sets, which provided a nice change of pace from my earlier pretenure experiences.

Chris Rosen: On Becoming an Elected Officer at AOM

I was asked to discuss what motivated me to take on leadership positions in professional organizations outside of my university. I have been asking myself this question quite a bit lately, as I am currently having a very busy week as the program chair for the HR Division of AOM (a big shout out to everyone who submitted their assigned reviews on time!). As anyone who has held office in SIOP will tell you, there are challenges associated with leadership roles in our professional organizations. These include balancing ongoing research projects, teaching obligations, and departmental and university service with the demands associated with external leadership roles. In my case, these demands have ranged from overseeing the development of a new website (I am a self-proclaimed luddite) to tracking down emergency reviewers and developing cogent paper sessions for the conference program (that's what I worked on this past weekend). You read that correctly—as a tenured professor, I voluntarily spent this past weekend working on something that is appreciated, but not required, by my university.

So, why have I taken on leadership roles in our professional organizations? Unlike Indiana Jones, I do not do this for fame and glory. Rather, I do it so that I can count myself among the numerous volunteers who are necessary for our professional organizations to thrive. Without members volunteering to serve on committees or take leadership roles, organizations such as SIOP and AOM would not be able to provide high quality resources and content (e.g., workshops, paper sessions, symposia). I have benefited greatly from having access to these resources and the volunteers that make them possible. As such, when my name was called, I felt that it was important for me to do my part by taking on a leadership role. In so doing, I would be able to give back to an organization that has benefitted me greatly over the years. At the same time, I would have the opportunity to work with others to shape the organization going forward and to ensure that it continues to provide excellent resources and opportunities to members.

In addition to viewing this as a way of giving back to an organization that has contributed to my professional success, I have also taken on leadership positions for less altruistic reasons. In particular, volunteering for professional organizations has provided a terrific opportunity for broadening my social network. I have been fortunate to work with a number of fantastic people while serving on the leadership track of the HR Division, including **David Allen, Ingrid Fulmer, Maria Kraimer, Dave Lepak, Anthony Nyberg, and Deidra Schleicher**. Working with these folks to address the myriad challenges that we have encountered as a professional organization has been among the most rewarding things that I have done in my career. I will conclude by saying that working through issues with leadership teams in our professional organizations is much more fun than attending a faculty meeting—trust me!

Max. Classroom Capacity: The Dreaded Group Project

Loren J. Naidoo

Baruch College and the Graduate Center, CUNY

Like most of you, I've spent much of February absorbed by the thrilling coverage of Olympic curling, an athletic spectacle unlike any other. As a good Canadian, I've spent many an evening screaming "Hurry! Hard!" at the TV in a fit of ecstatic *simpatico* with the vigorously sweeping titans gliding down the sheet, graceful as a cheetah scratching its chin. The strategizing, the polite sportsmanship, the coordinated yelling—these are groups working at their groupiest! Coincidentally, I have just started overseeing a set of student group projects in my undergraduate research methods class, with hopes for similarly lofty levels of excitement and achievement.

In fact, when I reflect on my academic career, I realize that almost every class I teach has a group project of some sort, but I'm not sure how much thought or planning went into that decision at the time. Thinking about it now, I can come up with a couple of reasons:

1. Students should learn to work together because most likely they will have to do that in their work and personal lives, and it's nice to make new friends.
2. For some groups in some classes, a kind of magic happens and the group is able to create something that greatly exceeds expectations—the group can be greater than the sum of its parts.

The flip side is that for some other students, group projects can be an academic nightmare like no other. In a spirit of well-intentioned masochism, I decided to dig up past student evaluation feedback on various group projects:

"The group project is long and dull"

"The (group) project is beyond torment"

(Some say the same of televised curling—pure balderdash and calumny!)

But somewhat to my surprise I found quite a few positive comments too:

"The thing I appreciate most about the class is the group work"

"The group projects help me to understand how to apply what we have learnt"

My original goal for this column was to provide a detailed report on the issues, considerations, controversies, and empirical evidence concerning the use of *Collaborative Learning* techniques, in about 2000 words. This, of course, is impossible. So instead, like my Olympic heroes and heroines, we will skim lightly across a slippery surface, with the hopes that some of our stones (of wisdom) will end up [*"on the button."*](#)

What are group projects?

Without getting bogged down, let's define group projects as a particular case of collaborative learning in which evaluated classroom activities involve three or more students actively communicating and cooperating with each other towards a common goal, under the guidance of the instructor. OK? OK. While we're defining things, curling can be defined as shuffleboard + chess on ice *on steroids!*

Why use group projects?

There are circumstances in which group work is beneficial for practical or structural reasons. It can allow students to work on projects which would be too much work to complete individually, such as conducting an empirical study in a research methods class, or a consulting project in an I-O psych or management class. Group projects may also reduce the grading burden of the instructor and/or TA, though if they are designed well, probably not by much.

Various theoretical reasons for the value of collaborative learning also have been proposed, including the notion that knowledge encoding is superior when occurring in a rich social context (Olmstead, 1974), collaborative work promotes the development of positive interpersonal relationships with fellow students (including multicultural relations; Aronson, 1971), self-esteem, social support, and positive attitudes towards school (Johnson et al., 2007).

In addition, the perceived value of teamwork skills to the workplace is evident in the attention they receive in the training/teams literature (e.g., Chen et al., 2004; Stoner et al., 2015) and in I-O and business classrooms. This value also is reflected in teamwork skills appearing on the list of AACSB learning standards. In sum, teamwork is valued by employers, and thus those who are concerned with preparing students for the work world tend to see the importance of developing student teamwork skills.

Are group projects effective?

There is a large literature in education, including several prominent meta-analyses (e.g., Johnson et al., 1991, Pae et al., 2015; Sung et al., 2017) which consistently supports the learning effectiveness of collaborative (versus competitive or individualistic) learning at various educational levels and across diverse contexts (see Johnson et al., 2007 for a review). As an example of evidence more specific to psychology, Tomcho and Foels (2012) conducted an underpowered meta-analysis of studies on group learning activities in psychology classes published in the *Teaching of Psychology Journal* between 1974 and 2011. They found a large positive effect for collaborative learning activities on outcomes including graded performance, nongraded knowledge, self-reported attitude/belief change, and behavior change.

What are the ideal conditions for group work?

Wait, wait, wait—what about social loafing? Doesn't that make group projects risky? Yes, social loafing is a real concern, but here are some guidelines (e.g., read Meyers, 1997) for how to avoid it, in brief: (a) The task must be divisible so that different students can take on different aspects; (b) the task must be additive such that contributions from every student are needed; and (c) individual performance must be identifiable, evaluated, and incentivized. To put it in more familiar curling terms: when you have the hammer in the tenth end and you need a simple hit and stay for the win but you throw a hog so the other team steals two, it's pretty clear that you're the hoser, eh?

For example, in addition to submitting a single paper for their group projects, I require students to submit evaluations of the contributions to the project of all of the group members including themselves. When students rate others (or themselves) poorly, I ask them to carefully describe the specific incidents or behaviors that led to the low ratings. I carefully examine these ratings and comments, and where the pattern of evidence indicates that one or more students were loafing, I adjust individual grades accordingly. This is a lot of work, especially when there are big disparities in the ratings. I have found it a worthwhile investment to help groups at the beginning to devise reasonable ways to divide up the work and assign specific tasks and deadlines. It also helps to make students well aware of the fact that their individual contributions to the group project matter, and that failing to do one's part will result in a lower grade. When I take the time to do this, the majority of groups seem to function well, which means they probably learn more, and there are far fewer ratings disparities to deal with. There are many other ways to achieve these ends, and Meyers (1997) provides a nice description of many of them.

There are many other questions to ask about how to design group projects, including: what are the optimal group size, project duration, task complexity, group and/or individual reward/accountability structure, and peer and/or instructor assessment methods? Here the literature yields disparate findings and many effects look to be context-specific. For example, Sung et al. (2017) found generally larger positive effects for collaborative learning on learning outcomes with groups of 4 and more than 4 compared to groups of 3 or 2. In contrast, Tomcho and Foels (2012) found no moderating effect for group size. Similarly, Sung et al. found that effect sizes were larger for project durations of roughly between 1 week and 6 months than for those less than 1 week or more than 6 months. In contrast, Tomcho and Foels found larger effect sizes for projects one to three class sessions long compared to half a semester or greater. Primary studies in different contexts also tend to produce different effects for these variables. There does not appear to be a simple story—perhaps we will revisit this issue in some future column.

Can technology help?

Yes! Only fairly recently did I get around to removing a standard line in my syllabi asking students to turn off their pagers in class. Technology advances! Mobile phones provide ease of access to a variety of helpful collaboration tools, especially in the context of hybrid/blended and fully online classes. Today I met with two groups of students to discuss their first group project in an asynchronous fully online research methods class. Most of these students are taking research methods fully online precisely because it is very difficult for them to come to campus for class or other meetings. So we met using Zoom, a platform similar to Skype which allows group audio/video conferencing, screen sharing, whiteboarding, hand raising, and so on. There are many other tools.

There are also people who conduct empirical research on the effectiveness of Mobile-Computer-Supported Collaborative Learning (mCSCL). For example, Sung et al. (2017) meta-analyzed 16 years of empirical research on the topic. In case you are wondering how long smart phones have existed (like I did when I read that paper—I googled it so you don't have to!), blackberry phones with e-mail were out by 2003 and the iPhone was released in 2007; their definition of *mobile* includes laptop computers and PDAs. They examined the outcomes of learning achievement, learning attitude, and peer interaction. They found large positive effects for mCSCL over noncollaborative learning and computer-less collaborative learning, and a smaller effect over nonmobile CSCL. The benefits for mCSCL were somewhat greater with larger group sizes suggesting mobile technologies mitigate some of the process losses due to a lack of social cohesion, lack of coordination or increased diffusion of responsibility associated with larger group sizes.

Nowadays most students will use mobile technology to help with group projects whether you intend them to or not, to their benefit—all the more reason to assign such projects! You know what else technology lets you do? Replay entire Olympic curling matches on your phone...

What are some ideas for innovative and effective group projects in my I-O psychology/management class?

Muir and van der Linden (2009) describe an incredible group project they developed that involved groups of 3 to 5 introductory psychology undergrads preparing and delivering a short lecture on psychology to local elementary school students. The task required students to deeply understand the target material and how to present it to a developmentally younger audience. This approach is particularly powerful as it combines collaborative, experiential, and service learning.

Another relatively intensive approach is Aronson's (1971) jigsaw classroom. A lesson is divided into a certain number of parts—let's say five as an example. The class is divided into groups of 5 students, each tasked with learning one of the five parts. All students assigned the first part get together to learn it, same with those assigned the second part, and so on. Then, each student returns to their jigsaw group, and teaches their part of the lesson to the four remaining group members. Here the task is divisible, interdependence is baked into the structure, and individuals are accountable for their own learning and that of their group mates.

If these sound like too much of a commitment, about 12 years ago I created a group project for my large social psychology classes which involved small groups of students creating a short and entertaining educational video about a social psychology theory or study and posting it on a then obscure website called YouTube. The idea is similar to Muir and van der Linden's (2009) (i.e., students as teachers) though I don't doubt the superiority of their approach. In full disclosure, this was probably the project that was deemed "beyond torment" by one articulate student. However, some groups produced incredibly creative, clever, funny, moving and insightful videos that I'm certain had a greater impact on their long term retention of that material than anything else in the class.

Please tell me about your experiences with group projects, good and bad: Loren.Naidoo@baruch.cuny.edu. And keep your broom on the sheet.

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SIOF in Washington: Advocating for I-O in Federal Public Policy

Since July 2013, SIOF and Lewis-Burke Associates LLC have collaborated to make I-O science and research accessible to federal and congressional policy makers. SIOF has embedded a foundational government relations infrastructure within the organization, enabling SIOF to develop an authoritative voice as a stakeholder in science policy in Washington, D.C. and to promote SIOF as a vital resource for evidence-based decision making.



Jill Bradley-Geist, University of Colorado Colorado Springs, and Bill Ruch, Lewis-Burke Associates LLC

Appropriations Update: Congress Reaches Budget Deal and Trump Administration Lays Out Spending Priorities

On February 12, President Trump released his second budget proposal to Congress. The fiscal year (FY) 2019 budget request reflects the political priorities of the White House, but it is ultimately up to Congress to decide which proposals to embrace, modify, or reject as part of the annual appropriations process.

Shortly before the budget was released, Congress and the White House agreed on new funding caps for both FY 2018 and FY 2019 in the *Bipartisan Budget Act of 2018*, which has paved the way for completing FY 2018 appropriations and establishing a FY 2019 budget framework. Although Congress is hoping to wrap up negotiations in March on FY 2018 funding levels for individual federal agencies, the president's budget request seeks to set an agenda for FY 2019, accompanied by a \$200 billion infrastructure package. Ultimately, Congress will decide FY 2019 funding levels, but the nonbinding budget request provides a window into activities and planning underway within the agencies and what programs will receive the most attention and focus in the year ahead.

With respect to funding levels proposed in the president's request, the Department of Defense (DOD) would be the clear winner, including a 19% requested increase for the Defense Advanced Research Projects Agency (DARPA). With the higher spending caps just approved, this budget request would provide mostly flat funding (the same level as FY 2017) for many of the largest civilian research agencies, such as National Institutes of Health (NIH), the National Science Foundation (NSF), and the Department of Energy's (DOE) Office of Science. This is in contrast to Congress, which is expected to use the higher caps to increase many of these agencies' budgets in the final FY 2018 appropriations bill. Not all programs fare as well in the Trump budget request. In a repeat of last year's recommendation, the request would eliminate several agencies and programs, such as the National Endowment for the Humanities (NEH) and the National Endowment for the Arts (NEA). These recommended eliminations are expected to again be rejected by Congress.

The budget request also seeks to impact education and workforce programs, including more than doubling the Department of Labor's (DOL) apprenticeship program. Similar to last year, the Department of Education (ED) request would decrease funding that supports college access and affordability, in part

to offset proposed increases for programs that enable public and private school choice. Most notably, the request would eliminate the Federal Supplemental Educational Opportunity Grant program, GEAR UP, and Title VI International Education programs while significantly reducing funding for Federal Work-Study.

Overall, President Trump's FY 2019 budget request would build on the previous year's emphasis on defense and national security at the expense of nondefense federal agencies and programs. The budget request also proposes further agency streamlining, reorganizations, and staff reductions. These changes reflect a multimonth process by the White House Office of Management and Budget (OMB) to shrink the size of the federal government and trim the number of personnel and offices required to conduct oversight or manage programs. Some of these staff reductions have already begun to occur, through accelerated "buy outs" of personnel, restructuring of offices, or staff attrition.

Lewis-Burke Associates LLC and SIOP will continue to monitor the situation and seek opportunities to engage on behalf of crucial research programs as deliberations continue.

SIOP Government Relations Introduces the Veterans' Transition Initiative to Congressional Staff

In December, **Adam Kabins** joined Lewis-Burke Associates LLC (Lewis-Burke) for a series of meetings with representatives from Capitol Hill to highlight the impacts and applications of I-O evidence-based research to assist veterans as they transition to the workforce; urge stakeholders to apply I-O research to related policies and programs; and position and promote SIOP as a collaborator and resource for these offices going forward.

The first wave of outreach meetings facilitated by Lewis-Burke were with bipartisan, bicameral congressional offices that have been heavily involved in the ongoing conversation over veterans' transition to the civilian workforce, including the House and Senate Veterans' Affairs Committees, respectively. The meetings were a complete success, as staff from each office expressed interest in learning more about the information provided in the Veterans' Transition Advocacy Statement, a guidance document developed by Lewis-Burke in conjunction with SIOP that outlines the critical importance of I-O research-backed solutions to enhance veteran employment experiences. Further, several committee staff pledged to consider engaging SIOP as a consultative resource in future discussions on veterans' workforce transition legislation that committees have begun to develop.

Through these meetings, the group learned that both House and Senate committees have been working with the Department of Defense (DOD), the Department of Veterans Affairs (VA), as well as other private organizations to focus on both veterans' transition to and retention in civilian jobs. Several committee staff believed that I-O research could be helpful in establishing metrics to measure a veteran's suitability for a civilian job and the development of strategies for translating military competencies a veteran has learned to civilian jobs. Lewis-Burke and SIOP will continue to interact with these offices and maintain the relationships built through the meetings.

This outreach was part of an ongoing collaboration between Lewis-Burke and the Government Relations Advocacy Team (GREAT) at SIOP. Lewis-Burke leads government relations outreach and seeks opportunities to profile I-O findings to federal stakeholders interested in veterans' transition. These efforts are in close collaboration with a team of SIOP experts led by Adam Kabins. The team will continue to coordinate SIOP efforts and I-O research and practice findings relevant to the transition of

veterans to the workplace and provide timely feedback and expertise to Lewis-Burke on pressing federal issues as they arise.

Message from Government Relations Advocacy Team Chair, Jill Bradley-Geist: How does your work relate to public policy?

On February 16, I had the opportunity to visit my State Capitol in Denver and participate in meetings where we heard from representatives and economists on pressing issues within the state (and also local and federal) government. Speakers included State Senator Owen Hill (R), State Representative Edie Hooton (D), State Representative Bob Rankin (R), and Natalie Mullis, Fiscal Director, Colorado Legislative Council.

A common theme of the remarks was the importance of the public's involvement in the legislative process. In particular, the Representatives welcomed input from academic and practitioner subject matter experts on issues related to key policy concerns. Examples of topical issues mentioned throughout the meetings included DACA, cybersecurity, workforce readiness as related to training and education, technology and automation in the workplace, population demographics, and the aging population/workforce. Several of these topics are rooted in I-O psychology and demonstrate the need for our science to be recognized by policymakers and considered in the development of policies at all levels of government, which are enduring goals for the Government Relations Advocacy Team (GREAT) and SIOP leadership.

We would love to know how your own work relates to government and policy issues, and if you have been involved in government advocacy at the local, state, or federal level! To share your thoughts and experiences, please contact Government Relations Advocacy Team Chair, Jill Bradley-Geist at jbradle3@uccs.edu. Also, please join us this April at SIOP 2018 Annual Conference in Chicago for a special session on SIOP Government Advocacy and linking your own work to advocacy and public policy issues (Friday, April 20, 3:00 – 3:50 PM – Wrigleyville: Executive Board Session: Link Your I-O Work to Federal Policy & Funding Opportunities).

Neuroscience, Outgroups, and Bad Behavior

Bill Becker
Virginia Tech

M.K. Ward
University of Western Australia

Xiaoyuan (Susan) Zhu
University of Connecticut

As the recent “Me Too” movement dramatically demonstrates, the modern workplace remains rife with reprehensible behavior that extends from negative politics, to abusive supervision, to sexual harassment. A recent [Forbes article](#) suggests that as many as 75% of employees are affected by workplace bullying. The persistence and extent of bad behavior suggests that it cannot be attributed to a few bad actors but rather that all of us are susceptible to our inner demons and there is reason to believe that social categorization may play a role in our Jekyll and Hyde transformations.

I-O psychology and social psychology has long recognized and explored the role of social categorization and in/out-groups in the workplace. The consequences can be ugly, including forms of aggression and stereotyping (Hogg & Terry, 2000; Nelson, 2009). Despite previous investigations, we still don’t have a full understanding of how these categorizations are made in work situations. Recent findings in neuroscience give new insights into this question. Spoiler alert: There can be drastic effects of these categorizations on brain processing. In this article, we will review these findings and suggest some ways that they might be incorporated into organizational research and practice.

Social Categorizations Are Often Nonconscious

One intriguing finding across a number of studies is that social categorization evaluations are rapidly initiated at an implicit level. A large number of these studies have focused on racial outgroups and suggest that is an implicit tendency to categorize members of different races into outgroups (Cunningham et al., 2004; Phelps et al., 2000). These studies have consistently shown differences in emotional processing for unfamiliar individuals from different racial groups. Preliminary findings suggest that implicit categorizations also extend to gender and other social differentiators (Chiao et al., 2008).

However, one study found that minority members also showed negative implicit response to pictures of unfamiliar male minority individuals (Lieberman, Hariri, Jarcho, Eisenberger, & Bookheimer, 2005). This has given rise to the perspective that although initial implicit categorization processes are influenced by race and other observable differences, subsequent processing and out-group determinations are more heavily influenced by threat perceptions relative to the self and other in-group members (Chang, Krosch, & Cikara, 2016; Checkrout, Everett, Bridge, & Hewstone, 2014). Still, it seems that social categorizations and out-group determinations occur primarily through emotional processing rather than explicit cognitive processing. The threat perspective of outgroups extends social categorization beyond discrimination to a broader range of organizational applications.

Outgroup Categorizations Are More Impactful When the Stakes Are High

In addition, the level of perceived threat also has a profound effect on the behavioral tendencies toward out-group members. Under conditions of low threat and plentiful resources, people tend to view out-group members with indifference (Cuddy, Fiske, & Glick, 2007). However, when threat is perceived to be greater and resources are scarce, people respond to out-group members with active hostility (Chang et al., 2016). This suggests that out-group effects are situationally dynamic in terms of their makeup and effects.

Outgroup Categorizations Shutdown or Reverse Social Processing in the Brain

Two related research streams help inform these effects by demonstrating the profound effect of out-group categorization on brain processing. The first relates to oxytocin, a neurotransmitter that influences social behavior. It has frequently been associated with increased trust, cooperation, and prosocial behavior (Bartz, Zaki, Bolger, & Ochsner, 2011). However, more recently these effects have been shown to hold primarily toward in-group members. In contrast, oxytocin has been shown to decrease trust and cooperation toward out-groups (De Dreu, 2012). Consistent with the threat perspective, oxytocin also increased defensive aggression toward outgroups (De Dreu et al., 2011). These findings show that social categorization can reverse the effects of oxytocin, a neurotransmitter beloved by many as the love hormone.

A related stream of research shows out-group categorization also influence the way empathy is processed in the brain. The automatic experience of empathy towards others is an important aspect of emotional intelligence. Numerous studies indicate that empathy is much stronger for ingroups than for outgroups (Chang et al., 2016). Once again, consistent with the threat perspective, when intergroup threat is high people often experience counterempathy (schadenfreude) in response to outgroups. Once again, the neuroscience evidence supplements these findings by showing that brain processing of empathy is enhanced for ingroups and essentially turned off or even reversed for threatening out-group members by dehumanizing them (Harris & Fiske, 2006; Xu, Zuo, Wang, & Han, 2009). A key take away here is that both research streams highlight the power of context and framing to flip the relationships between neural activity and behavior, effectively turning a normal individual into a psychopath toward outgroup members.

Implications for Research and Practice

Although the basic research has tended to focus on racial outgroups, the findings can be generalized to the workplace in a number of promising ways. First, it seems that organizational power and politics can give rise to perceptions of competitive or antagonistic relationships between coworkers and between leaders and subordinates. These perceptions may give rise to nonconscious categorizations of out-group status. Second, a better understanding of the dramatic effects this can have could explain the prominence of abusive supervision, sexual harassment, and workplace bullying that continues to plague organizations. It may also inform research on organizational justice and ethics by emphasizing the importance of emotions and the impact of in/outgroups on emotional processing and subsequent unethical behavior. Third, this stream of research can increase our understanding of the impact of social categorization on employee selection and promotion. Applicants and employees who are considered to be in-group members may be more likely to be selected for a job and promoted to a higher position (Davison & Burke, 2000).

From a practical perspective, these insights could inform organizational education and training to increase awareness of the impact of social categorization and provide individuals at all levels of organizations with tools for expanding their ingroups and shrinking outgroups while also avoiding the bias traps

of in-group love and out-group hate. This research is particularly important for human resources professionals who work actively to minimize discrimination in the workplace. Finally, [work design](#) may be able to reduce such biases by fostering identity development and expansion from narrow to collective identities (Parker, 2014). Overall, we see that both neuroscience and work context are essential tools in our quest to reach a full understanding of the processes that create and sustain social categorizations.

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Awards Spotlight: The Path to Fellow—Dr. Leslie Joyce

In this installment of the *TIP* Awards Spotlight, we continue our focus on the SIOP Fellow process. In the first article of our series, we interviewed the current chair of the SIOP Fellow committee **Dr. Kenneth P. De Meuse** to learn more about the process and his recommendations. The second article saw an interview with **Dr. Cheryl Paullin's** path to becoming a Fellow. In this third installment, we continue our Path-to-Fellows interviews with **Dr. Leslie Joyce**. Receiving her doctorate from North Carolina State University, Dr. Joyce has spent most of her career in the talent management space specializing in employee and organizational development and effectiveness. Dr. Joyce's employee development emphasis is not surprising giving her half namesake role in the likewise-development-focused Leslie W. Joyce and Paul W. Thayer Graduate Fellowship in I-O Psychology. More recently, Dr. Joyce has transitioned into leading global human resource functions, particularly as the chief people officer for a global manufacturing company.

Dr. Leslie Joyce's Path to SIOP Fellow



Becoming a SIOP Fellow requires an *unusual* and *outstanding* career as applied to one or more of five specific areas: *research, practice, teaching/education, service, and administration*. A candidate's qualifications are summarized collectively in a six-part professional dossier including a *self-statement, curriculum vitae, nomination letter, endorser list, and endorser letters*. It is not uncommon, notes De Meuse, for an ultimately successful application to be built over the span of years with the help of one's colleagues (Howardson & Munson, 2017). Indeed, Dr. Joyce confirmed as much (noted below by **A**) when we asked (denoted below by **Q**) about her Fellows experience.

Q: If you wouldn't mind, please describe the "work" you did that you think played a key role in becoming a fellow. As follow ups, what were your innovations/unique contributions to the field? How did you "significantly" impact the field in line with the qualifications for becoming a Fellow?

A: I think the key for me was to stay firmly engaged on both sides of the scientist – practitioner continuum. I was committed to being an I-O psychologist and a leader in a corporate environment. To do that I had to stay current in I-O practices and be well versed in the nature of applied settings. That requires technical capability as well as intellectual and professional flexibility. I focused on publishing and speaking and ensuring the implementation of I-O best practice. I was committed to moving the practice forward (contributing to advancing the field) and in sharing those successes with others so they could add their efforts to advancing the field. I did a lot of work in the employee survey area driving new levels of effectiveness in action planning, made contributions to the design of assessment centers, created practices for change management that raised the bar.

In keeping with the Fellow requirements, Dr. Joyce's career-long work has been truly unusual and outstanding. As De Meuse notes, one characteristic of a Fellow-worthy career is making one's work accessible and available to the I-O psychology field writ-large beyond one's own immediate work setting. Communicating as such is most effectively done when describing unambiguous contributions, preferably, using specific metrics quantifying the candidate's extended impact. An unusual and outstanding career, in other words, requires not only individual success but also elevating the work of one's peers to support overall advancement of the I-O psychology field. So it has been with Dr. Joyce's career by publishing, speaking, and implementation work focused on helping others "add their efforts to advancing the field."

It is important to note that identifying such efforts solely from one's own perspective can be challenging. As De Meuse has previously noted, the importance of feedback from one's peers throughout the Fellows application process should not be understated. Indeed, as noted below, Dr. Joyce echoed a similar recommendation when recounting her own path to SIOP Fellow, particularly as related to writing one's own self-statement.

Q: What did you include in your self-statement?

A: This was far harder than I anticipated. It is so hard to think of what you do every day as special, unique or noteworthy. It's just what you did. It really helped me to get other people's perspective on my contributions so I could see them objectively for what they contributed to the field. Once I distanced myself from myself—I could see more clearly. The key elements I included in my statement highlighted my work in leadership development, employee engagement and talent management as well as my contributions through publishing and speaking. A key element was illustrating how I had broadened the audience for I-O by bringing our perspective to other fields.

In a similar vein, De Meuse notes that the most effective self-statements are those adopting a more neutral and objective perspective about one's contributions using, for instance, specific metrics (e.g., published new assessment center structure adopted by x number of peers in other organizations/industries). Note, however, that objectively stating one's contributions need not be overly modest. In fact, Dr. De Meuse notes that the self-statement is *precisely* the appropriate time to promote one's career accomplishments. Remember, the criteria for becoming a SIOP Fellow do not require a "good" or "successful" career but rather an *unusual* and *outstanding* career, the communication of which might be challenging without highlighting or promoting career accomplishments in kind.

As both Drs. Joyce and De Meuse note, the Fellowship onus is not to be assumed alone. Indeed, when asked to offer recommendations for others pursuing the Fellow path, Dr. Joyce emphasized the importance of one's colleagues and remaining active in the broader I-O community.

Q: What advice would you give to those interested in becoming a fellow?

A: There are so many terrific role models to choose from. Get to know them—what they did and how they did it. Keep a well-balanced network (both practitioners and academics) and value all the members of that network. Give back to the Society by publishing, speaking and mentoring.

Q: What do you think is the "secret sauce" to becoming a Fellow as practitioner?

A: I think the secret sauce is to demonstrate commitment to the science and to build the bridges between the science and its application that move the needle on excellence in corporate practices. I also think it's important to be involved in the Society—to publish, to speak, and to mentor within the profession.

Perhaps *the* most important colleagues in the Fellow process are those of the nominator and the endorsers. As Dr. Joyce notes below and as previously noted by Dr. De Meuse, the relationships between nominator, endorsers, and candidate should not be tangential; successful Fellow applications include endorsement letters from several colleagues intimately familiar with the candidate's career work. Further, identifying colleagues qualified as such is less a function of the endorsers' overall notoriety in the field and more a

function of their knowledge with the candidate's work. Such qualifications are best adjudicated with help from the candidate's nominator, which, as noted below, was precisely Dr. Joyce's experience.

Q: Can you describe the nomination process? How did you get nominated? Did you find someone to nominate you, or did someone else nominate you? How did you find people to endorse you or did your nominator do that?

A: My nomination came straight out of the blue, and I was so honored. It was something I did not think I would achieve in my career as it is the pinnacle of professional and academic recognition for us. A colleague that I have known and worked with for many years nominated me. He and I worked together on who to contact for endorsements and then he took it from there. It was quite nerve wracking to go through the process, but I'm very honored.

Summary and Conclusion

As noted by De Meuse and confirmed by our interview with Dr. Joyce, the process of becoming a Fellow is necessarily collaborative requiring colleagues intimately familiar with one's work. To be sure, one's colleagues acquire such knowledge not overnight, but over years. The process of becoming a SIOP Fellow, in other words, really begins decades prior to compiling one's application. As we noted in our first Fellows process article, "the SIOP Fellowship is an unusual and outstanding recognition covering, at least, a decade of one's work and life; communicating achievements as such, not surprisingly, might take more than a few weeks" (Howardson & Munson, 2017).

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About the Authors

Garett Howardson is the founder and principal work scientist at Tuple Work Science, Limited and adjunct psychology professor at both Hofstra University and at The George Washington University. Most of his work focuses on quantitative, psychometric, and/or computational issues to better understand the psychology of modern, technical work writ-large (e.g., aerospace technicians, computer programmers). Garett is also an avid computer geek. In fact, he has a degree in computer science, which he avidly applies to his research and work in pursuit of one deceptively simple goal: better integrate I-O psychology and the data/computational sciences to understand work.

Liberty Munson is currently the principal psychometrician and assessment and exam quality lead at Microsoft. She is responsible for ensuring the validity and reliability of Microsoft's certification and degree programs. Her passion is for finding innovative solutions to business challenges that balance the science of assessment design and development with the realities of budget, time, and schedule constraints.

Liberty loves to bake, hike, backpack, and camp—basically, if the sun is shining you'll find her enjoying the great outdoors; if not, she's in her kitchen tweaking some recipe just to see what happens. She has also been actively involved in editing Microsoft's Cookbook to raise money for a local charity, FareStart, as part of Microsoft's Give Campaign. And, she just got a new mini schnauzer puppy, Apex!

Learning About Learning: The Mythical Land of I-O

**Tom Whelan and Amy Duvernet
Training Industry Inc.**

In our last column, we talked about some of the misconceptions that I-Os may face when interacting with L&D professionals. As we've said repeatedly in this column, both sides have a lot to learn from each other. On the flip side of the coin, there are some I-Os who hold beliefs about workplace learning that don't necessarily jibe with what's going on in the practitioner space. In this column, we'd like to talk about several "myths" about training that some I-Os may have bought into over time.

L&D Is All About Assessment and Evaluation

This is far from the truth. Although we I-Os tend to focus heavily on using data to inform decisions, that's not the primary focus of the bulk of L&D activities. There are more pieces of the puzzle to contend with than the narrow avenue of evaluation. Training organizations must be capable of enacting at least eight critical processes, including content development, training delivery, technology integration, administrative services, portfolio management, strategic alignment, and both diagnostics and reporting and analysis, which encompass needs assessment and evaluation (Harward and Taylor, [2014](#)). At a minimum, learning and development organizations must engage in administration to assign and track training and delivery before they even begin to focus on evaluation, and realistically, most of these processes must occur and be executed well before evaluation can come into play. In order to ensure the training is effective, good content development and strategic alignment between processes and business goals are critical. In large organizations, managing learning technologies and the entire training course portfolio can require the attention of entire workgroups. In fact, a recent work analysis of training managers revealed that managing technology was the second most frequently performed job responsibility in the role ([Training Industry, Inc. 2017](#)).

A similar myth encompasses the idea that all training programs should be evaluated using each of Kirkpatrick's (1959) four levels of evaluation. The fact is, training organizations typically lack the resources (e.g., funding, time, personnel) needed to evaluate every program at more than one level, let alone all four. Perhaps this is why so many programs default to "smiley sheets" (i.e., Kirkpatrick's level 1 reactions). The reality is (and dare we utter this sacrilege), it's probably not necessary to evaluate *all* programs. Before you send us off to be reeducated on the importance of data-based decision making, hear us out. If a training organization is operating with a limited budget, they may not have the resources to offer all of the critical programs needed and evaluate them each time. If faced with a dilemma of whether to offer multiple learning programs designed to meet a critical need or offer only one but evaluate it well, how should an L&D professional proceed?

The answer, as with all things we encounter, is "it depends." We think the focus in our field on evaluation and assessment is a natural and important extension of our strengths. But, we want to challenge

our readers to consider providing more guidance on when to evaluate and at what level. Are there instances where level 1 reactions can answer the most critical evaluative questions? When is it worth the investment to capture data at multiple levels? Finally, consider how the data are used and offer guidance that extends beyond how to measure. For example, Kurt Kraiger and Eric Surface are adding to this conversation with their work investigating how to communicate value to stakeholders once evaluative data are collected ([2017](#), [2018](#)).

L&D Professionals Have Access to Data

Similar to the idea that L&D is all about evaluation, this myth gets at the assumption that L&D professionals have various kinds of data at their disposal and just aren't using it. Whether it's data from work analysis activities, employee performance, attrition data, satisfaction surveys, and so on, one would be hard pressed to find an L&D professional able to make decisions with the benefit of all of the information a company has on hand.

For example, as we've drilled into our graduate students time and time again, work analyses are the foundation of most HR systems; how often do you think those data are shared with L&D teams when collected? The answer, in our experience, is not often enough. Further, we know that L&D solutions can impact more than just performance (e.g., turnover and absenteeism, work related injuries, employee engagement, team cohesiveness, etc.), but are training personnel able to access that data without gathering it themselves? We hear time and time again from those practicing in the L&D field that they struggle to identify sources of such data and when they do, they face challenges convincing others to share.

So, what's with the data hoarding? We think there are a number of concerns driving this, including the need to protect employee privacy, and the possibility that data may be misused, misinterpreted, or stray from the stated purpose for which data were originally collected. There are also hurdles related to the labor involved in gathering, merging, and cleaning such data, a task that typically falls to the group holding the data rather than the requesting L&D team. Given these complex issues, what can we as I-Os do to help?

We're in a unique position to advocate for data sharing and to facilitate training professionals' requests, because we understand that data-driven decisions are far more likely to result in positive organizational outcomes. By working closely with L&D teams, we can help them identify and better understand the kinds of data they may need, the formatting in which they will likely want to receive it, and the processes they'd need to undergo to utilize it. Those of us working in a talent analytics functions can also partner with L&D to provide those kinds of insights and advocate for greater use of data in L&D processes.

Training and Education Are the Same Thing

What's the difference between "education" and "training"? Although your answer may go in many directions, we feel the importance lies with the overarching objective of learning. Loosely defined, education is concerned with teaching the theory and background of a concept; the goal isn't necessarily for a learner to gain strategies for practical application, but to be exposed to information that increases their understanding. Training, on the other hand, seeks to impart specific skills or job-relevant knowledge to a

learner, with the aim that the new knowledge or skills acquired in training can be applied back to a learner's job. The former is typically wider in scope than the latter, but both are important to building productive competencies.

If you're thinking, "huh?" at the preceding paragraph, let's draw out this distinction another way using a stats example. (Because we all love those, right?) Let's say you're very well versed in how a correlation works: what the formula is, the assumptions, matters of statistical power, how to interpret the correlation coefficient, and so on. You're well educated about correlations but might be poorly trained in how to apply this knowledge to a real-world problem. On the other hand, you might be quite adept at running a correlation in any software package, generating a scatterplot, working with outliers in the data, and so on, but when explaining the results to company stakeholders run afoul of the golden rule of "correlation does not imply causation." You're well trained in how to use a correlation, but poorly educated on their background.

Why bother to draw this line in the sand? Some people may think of training as "learning things directly related to work" and education as "learning things that may or may not have to do with work," with little else to distinguish the two. Training, obviously, is much more consequential to an individual employee than education. Why is that? Here's a partial list of the impacts that training can have:

- Training outcomes can be used to inform promotions, layoffs, or other job actions;
- Training can be a critical piece of meeting regulatory and compliance requirements;
- Training upskills employees on using new pieces of software, hardware, or familiarizing them with new processes;
- Training is the best vehicle for onboarding new employees to the culture and policies of an organization;
- Training can be used to provide knowledge and skills at the point of need (sometimes called "just in time" training) when a job demands it;
- In many organizations, training is a key component of strategy, not just for HR, but at the enterprise level, where it can even serve as a competitive differentiator in a market.

Does education have those impacts? We'd argue no, or at least not remotely to the same extent. We hire people based on their education and experience, whereas training fills in and insulates the gaps in knowledge and skills, and those gaps can and will differ across jobs and industries. Another way of thinking about this is whether your graduate education in I-O prepared you with everything you needed to know for a job in academia or practice. Did you already have the people skills to behave like a professional across all the situations you'd face? At hire, did you understand how to navigate the processes and systems you'd interact with in your job? Were you prepared to handle the shifting social dynamics and demands on your time? To varying degrees, some of us did, but it's impossible that this is true of everyone in the I-O community. We had the education, but we needed training—we had to learn more, and what we needed to learn was patently job relevant in nature. This is precisely the challenge with which all L&D functions grapple. So, although training and education both involve learning, the stakes for training (and for bad training) have consequences at the employee and organizational levels in a way

that education usually does not. Conflating the two things together may seem harmless (and might be in some situations), but if their repercussions were the same there wouldn't be two distinct industries that focus on learning and both personal and professional development.

Conclusion

The point is that although L&D professionals can learn a lot from our field, we also have a lot to learn about learning. We've discussed the relatively limited focus on training in the I-O field in previous columns (e.g., [Whelan & DuVernet, 2017](#)). Where I-O practitioners are well-represented in selection, change management, and other areas, L&D is a critical part of organizational functioning that deserves more attention from the I-O community. You can hire the best people, based on complex statistical models and validated preemployment tests, but *nobody* comes into a job knowing everything they have to learn.

We originally conceived of this column as a stimulus for "more thought and focus on the ways in which I-Os can contribute to the L&D space, with the ultimate goal of observing [an increased] number of I-O articles, research studies, and collaborative applied projects related to training" ([DuVernet & Whelan, 2016](#)). Unfortunately, if the session focuses of our annual conference are any indication, it appears there's still much work to be done. With 11 sessions listing training as a primary focus area, this year's conference features five fewer training related sessions than last year and continues a downward trend over time (see Figure 1 and [SIOP Program Explorer 2008-2016](#) for more information).

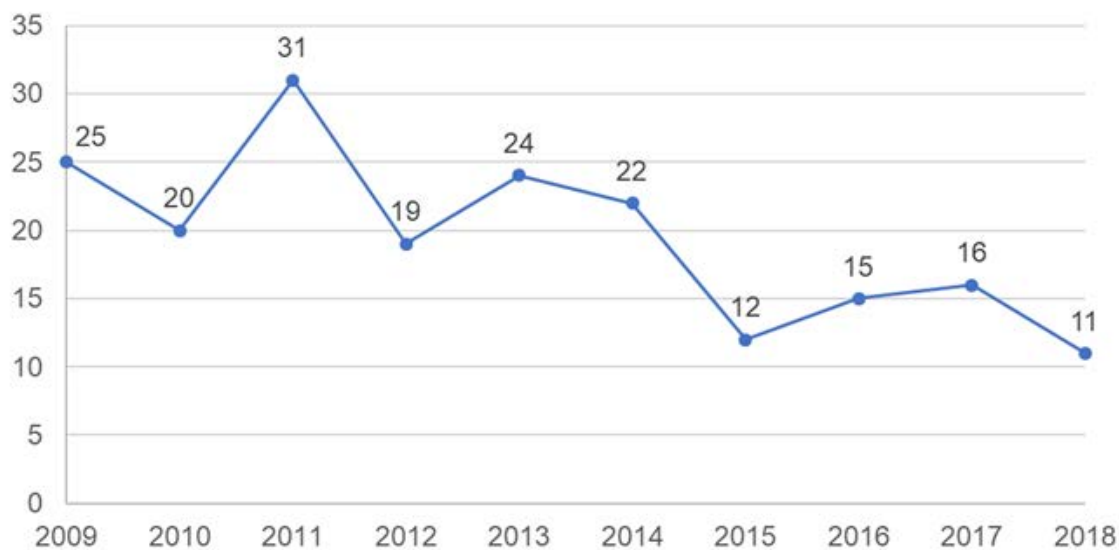


Figure 1. SIOP Conference Session Listing Training as Primary Content Area Over Time

Thus, as we close our tenure as columnists for *TIP* and reflect on the [L&D journey](#) we've traveled, we know that we've just scratched the surface of this need. We've provided information about L&D roles and the ways they are organized within companies; we've highlighted trends in training from both the I-O and L&D perspectives; we've hopefully busted a few myths without annoying too many people. Most importantly, we hope we've inspired you to learn more about learning (and development) to continue

down the road toward more cohesiveness across our two complementary fields. Although we're hanging up our hats, we want to stress how important it is for you to consider how you fit in this puzzle and how you might apply your skill set to contribute to L&D. As stated by [Gary Latham \(2009\)](#):

It is we academics/scientists who provide the theory and empirical data that enables we practitioners to differentiate ourselves in the marketplace from, and make ourselves invaluable to, decision makers in the public and private sectors.

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International Practice Forum Special Series
Industrial-Organizational Psychology Helps Heal the World (Part 3): Using Industrial-Organizational Psychology to Facilitate Restorative Change with a State Prison Population

Lynda Zugec
The Workforce Consultants

Walter Reichman
Org Vitality

In this issue, we continue on our exciting new development for the International Practice Forum! With Walter Reichman (OrgVitality) and a number of I-O psychology practitioners and academics, we explore the ways in which “Industrial-Organizational Psychology Helps Heal the World.” Through a series of articles, we present real and actionable ways in which I-O academics and practitioners have an impact in innovative and creative ways and how they have been helping to heal the world!



**Using Industrial-Organizational Psychology to Facilitate Restorative Change
With a State Prison Population**

Brian D. Cawley
Calvin College

Laura J. Shankster-Cawley
Talent Asset Advisors

Nicole Karl
Calvin College Center for Social Research



Statistics on crime and the prison system in our country are sobering. Headlines and news feeds are filled each day with dire stories of crimes and abuses that have a dramatically negative influence on our society. For example, here are just a few grim stats from a recent report produced by the United States Bureau of Justice¹:



- Approximately two-thirds (67.8%) of released prisoners were arrested for a new crime within 3 years of release, and three-quarters (76.6%) were arrested within 5 years.
- More than a third (36.8%) of all prisoners who were arrested within 5 years of release were arrested within the first 6 months after release, with more than half (56.7%) arrested by the end of the first year.
- A sixth (16.1%) of released prisoners were responsible for almost half (48.4%) of the nearly 1.2 million arrests that occurred in the 5-year follow-up period.

As I-O psychologists, we invest our time and talents in careers studying the intersection of people and work. We are specialists trained to observe and diagnose behavior within organizational contexts to drive organizational performance. Certainly, a fair degree of our work involves those preparing to enter new jobs and even students early on in their vocational journeys. Our ability to measure individuals' unique constellations of KSAOs undoubtedly helps people find work in which they can succeed and, in turn, helps contribute to the success of organizations at large. However, our target group is typically

those already actively engaged in the job search process with relatively easy access to information about organizations, jobs, and themselves.

Clearly, there are populations of potential employees that we are unable to reach through traditional avenues; one such population gaining increased attention is that of incarcerated individuals. As a society, we are slowly engaging in more constructive conversations about how we can collectively embrace the restorative power of work to not only ease societal reentry of former offenders but also to reduce recidivism rates. However, the process is complicated by a web of legal, cultural, and societal limitations—not the least of which is employers' unwillingness to seemingly "take a risk" on someone with a felony conviction.

As academic practitioners, we are continually challenged by our students to articulate not only what makes work scientifically "good," but also to discuss the broader purpose of work in our lives. In our journey of understanding the inherent restorative power of work, we have been challenged by the thought that for some in our society, the concept of meaningful employment seems unattainable. This is due to the figurative and literal bars that have resulted from various life choices and circumstances, and create a real barrier for those individuals who are ready to take their place in the world. While we were asking ourselves questions surrounding the restorative power of work, we learned of some groundbreaking work being done by the professionals of the level II, medium security Richard A. Handlon Correctional Facility in Ionia, Michigan, less than an hour away from our classroom in Grand Rapids.

In their own words, their unique Vocational Village Program "is a first-of-its-kind skilled trades training program that aims to provide a positive learning community for prisoners who are serious about completing career and technical educations."² Prisoners are not only enrolled in full days of training and classroom instruction that mimic a real work environment, they also receive state and nationally recognized certifications in their trade upon successful completion of the certification process and graduation. Given the nationwide shortage of employees in the skilled trades, the prison has found employers throughout the state willing to recruit from the offender population and the placement rate of graduates is currently over 70%. The offenders are filling a vital need for the employers, but the transition to gainful employment is not without pitfalls for many of the graduates. Although the employers have reported that the graduates' technical skills are solid, many of the Vocational Village Program graduates lack, or are unaware of how to demonstrate, general employability competencies (e.g., dependability and reliability, adaptability and flexibility, initiative, professionalism, teamwork), which makes the onboarding and probationary period challenging.

We approached the prison leadership with a proposal to create and administer a Developmental Assessment Center for Vocational Village Program to students who are nearing their graduation and parole dates. The center provided an assessment of their general employability competencies and produced development reports for each offender to use as they prepared not only for employment but also for the start of a career in the skilled trades. For some of them, this was their first time achieving employment in something other than entry-level, part-time jobs. The process was developed and administered by 30 upper-level undergraduate students enrolled in an industrial-organizational psychology course at Calvin College in Grand Rapids, Michigan, under the direct supervision and guidance of two professors. In addition, a team of experienced assessors from the business and professional community were recruited to provide the offenders with "real-world" feedback while also giving the employers insights into

the program and the competency levels of this cohort of graduates. This way, they could further communicate the benefit of the program to additional potential employers of the graduates.

The professors and research assistant who served as the project leaders began the planning process 2 months prior to engaging the college students in the work. The project included:

1. Needs assessment with instructors, employers and a review of the literature to identify the assessment competencies;
2. Development of an assessment protocol consisting of psychometric assessments and feedback via the jobZology® platform (values, interests, personality, and workplace preferences), a team project solving simulation, and a structured competency based interview;
3. Development and delivery of participant preparation materials;
4. Virtual training of 44 assessors;
5. Administration of the center to 32 offender participants within a 3-hour assessment window physically inside the prison;
6. Writing of reports containing developmental feedback on each competency for the participants.

The direct benefits to the offenders are quite typical of any assessment process but with a unique lens. For some, their familiarity with formal hiring assessments was minimal, but now they gained the opportunity for recruitment by several international corporations in Michigan who employ state-of-the-art hiring systems. Thus, the men were introduced to new assessment tools, such as jobZology®, that they may potentially encounter in the regular recruiting process and were given the opportunity to “prepare/practice” their performance before the event. The preparation process targeted their attention on competencies (beyond technical skills) that are important to employers. Although the instructors and prison staff reinforce many of these competencies, it easy for the offenders to “brush them off” and not take the feedback seriously. Therefore, the entire conversation leading up to the actual assessment became an important source of development. The event itself generated a tangible energy among the offenders as they were able to engage with one another and provide support to one another during their orientation time, team problem-solving exercise, and when escorted to their individual interview rooms. The assessment evening started with a sense of quiet anticipation and ended with engaging conversations, laughter, and, for many, an eagerness to receive and read their development report.

As with any service learning initiative, our college students received many benefits from their participation as well. First, they were able to engage in a multicultural experience involving interactions with individuals from varying cultural perspectives within the unique institutional culture of a prison. Although our student body consists of roughly 30% international and/or students of color, the interactions at the prison gave them exposure to the unique culture that develops within correctional facilities. Throughout the project, students reported that their preconceptions of prison life and incarcerated individuals had been radically different from the reality they experienced. It was typical for students to be somewhat reserved upon entering the prison, but almost without exception, we witnessed radical transformations as they engaged in conversations about shared experiences such as the challenges of finishing class-work, preparing resumés, contemplating vocational choices, and the process of job hunting. Second, they not only learned the theories supporting assessment and development, and discovered the challenges of translating such theories to the administrative realities facing organizations, but they were able to build relationships with people they were serving. Suddenly the long hours of creating behavior-

ally anchored rating scales (BARS) and designing a group problem solving activity that could be conducted with “prison-approved supplies” became easier because they did not want to let the offenders down. Several students even decided to volunteer as tutors or interns at the prison because of this project. Finally, they were given a unique perspective on the restorative power of work as they saw first hand the way the men “lit up” when answering questions about their work, when they proudly displayed the results of their training, and when the men talked with utter astonishment about the fact that for the first time in their lives they may actually obtain benefits like healthcare and even a 401k. The students were struck that these “standard benefits” that many college graduates take for granted represented real life-changing potential.

Of course, the offenders and our students were not the only ones transformed. As project leaders and I-Os within both academia and applied settings, we have been further convicted that we have been so busy studying the intersection of people at work that we have looked past the restorative power of “work” itself. Engaging with individuals for whom the opportunity to work has been taken from them and is now once again within reach has allowed us to witness the immense power work has to restore purpose and dignity. While using our training to help restore the lives of our fellow citizens through developing their skills for re-entry into the workforce, we have to take a step back and first remember and appreciate the restorative power of work for us all, and what that means for us all to flourish in our work environments.

Do you know of someone who is using I-O psychology to heal the world?

WE NEED YOU AND YOUR INPUT! We are calling upon you, the global I-O community, to reach out and submit your experiences for future columns. Give us your insights from lessons learned as you help heal the world.

To provide any feedback or suggestions on the International Practice Forum, please send an email to the following address: lynda.zugec@theworkforceconsultants.com

Notes

¹ Recidivism of Prisoners Released in 30 States in 2005: Patterns From 2005 to 2010—Update.

<https://www.bjs.gov/index.cfm?ty=pbdetail&iid=4986>

² http://www.michigan.gov/corrections/0,4551,7-119-33218_75514-389694--,00.html

Spotlight on Humanitarian Work Psychology: Project FAIR: Fairness in Aid Remuneration

Ishbel McWha-Hermann
University of Edinburgh

Morrie Mullins
Xavier University

I'm pleased this issue to welcome a guest coauthor, one of the founding members of the Global Task Force for Humanitarian Work Psychology and the first Chair of the Global Organisation for Humanitarian Work Psychology (GOHWP), Dr. Ishbel McWha-Hermann. This is not Ishbel's first time in *TIP*'s pages—far from it! Readers who have followed this column have seen her name in the byline in the past, and mentions of her important work both in the “Spotlight” column and in reports from SIOP's UN team. She has lived and worked all over the world, and through her work has developed a perspective on issues related to work in the humanitarian sphere that has helped to significantly expand the borders of I-O psychology.

One of her recent undertakings is Project FAIR, which she described last summer on the [GOHWP website](#). Because this is such an important project, I asked her to write a piece on it for *TIP*, and she graciously accepted. She first provides some background on Project FAIR and its precursors, then answers several questions *TIP* readers might have about the project. With that, I give you Dr. Ishbel McWha-Hermann!

Background

When international nongovernment organizations (INGOs) send staff abroad they traditionally send them on an international reward package, which includes pay benchmarked to global pay data, and different benefits and allowances to those given to national staff. Historically, those sent on international packages were from the headquarter country, or from other similar (higher income) contexts, so the international package was used to attract skilled people into these roles, and to reflect the market from which they were being recruited. Times have changed now, though; for example, we see more regional-level and South-South recruitment, as well as increasing skills amongst national staff, bringing the relevance of these big packages into question.

The focus of this column is on Project FAIR, which builds on previous research that examined the psychological impact of reward packages offered to national and international employees of 202 organizations in six countries. In the original project (Project ADDUP) we found dual salaries (i.e., where national and international staff have different remuneration scales) had a negative impact on employees, but particularly on host country national employees in terms of motivation, satisfaction, and thoughts of leaving the organization.

One of the key goals following Project ADDUP was to reach out to INGOs and share the results of the project, in the hope we might facilitate some change in how staff are rewarded. What we found was that human resource (HR) and reward managers didn't need evidence of the issues with dual salary systems. Rather, they needed evidence-based alternatives to these systems. Our findings aligned with what managers were hearing from their staff feedback, and they felt frustrated about the situation, but powerless to change it without research into how it could or should be done. As we spoke to organizations about the issue, we also discovered that some

had started trialling different reward options, but few were speaking to one another about what they were doing and how it was working.

Project FAIR was born from the desire to gather these options together and begin to build an evidence base of different reward options that are being used by organizations. We wanted to gather stories from organizations about what works and what doesn't work, as well as the challenges faced in the process. HR and reward managers could then use this information as a basis for making decisions about how to set up rewards in their own organizations. We undertook 18 qualitative interviews with HR and reward managers from 15 INGOs of varying size and scope, and developed some insights into the different approaches to reward that are being undertaken, as organizations try to find ways to make their reward systems fairer. A full report on the project findings is available on the website www.project-fair.org.

How did you get involved in Project FAIR?

Having worked in the NGO sector in both India and Cambodia prior to doing my PhD, I was drawn to issues of intergroup dynamics within development work, and the complicated role of social identity and social dominance on the long term prosocial goals of international aid and development work. Disparate salaries between national and international employees are one clear source of dominance and potential conflict for employees. I began looking at the psychological impact of dual salaries during my PhD with Stu Carr at Massey University, and continue to focus on this in my own research at the University of Edinburgh, with a particular focus on organizational justice.

What have been some of the key outcomes of the project?

Of the 15 organizations involved in the project, three have already eradicated the dual salary system, and a further five have developed what we have called a 'hybrid' system, where they have taken steps toward reducing the gap between national and international reward, but still retain a dual system of some kind. Examples of this might be putting international employees on headquarter packages, rather than international packages, or matching executive salaries for all employees regardless of nationality. We were surprised to find such a lot of variability between the organizational approaches. However, while we found that organizations are taking different approaches to developing fairer systems there are some strategic issues that are commonly addressed before making changes, for example, deciding on their mobility strategy, commitment to localization, and examining their total reward package.

A published report of the full findings is available on the [project website](http://www.project-fair.org), along with six organizational case studies. We are really excited about being able to produce these case studies as open access resources. We've already had a lot of great feedback from INGOs that they are really helpful for enabling them to think about how they might address the topic of fair reward, and to use as tools to advocate for change within their organizations. Side note for academic readers - they are also a great resource for teaching!

In addition to the project outputs, we ran a full-day interactive workshop with HR and reward managers in London, as well as three webinars for audiences from different parts of the globe. There has been a huge amount of interest in the issue, perhaps (at least in part) because of the

pressure on the INGO sector from international agreements like the [Charter4Change](#) (which focuses on the importance of localizing roles in INGOs), and the [UN Sustainable Development Goals](#) (SDGs) (Goal 8 specifically aims to have equal pay for work of equal value by 2030.)

Throughout all the interactions with practitioners the important role of academic researchers in facilitating knowledge sharing on a sensitive topic has been emphasised. As external and objective individuals we enable organizations to talk about reward-related issues and challenges they face and brainstorm ideas, as well as share lessons learnt, but to do so in an anonymous way.

What have reactions been to your work, from the various constituencies involved in the international aid sector?

The project has been welcomed by most major INGOs, some of whom we have now developed longer term relationships with and plan to engage in ongoing research on the topic. There is a general feeling within the INGO sector that for systemic change like this to occur organizations need to move together, not in a pay-fixing, prescriptive way, but in a collaborative way that helps to move the sector toward paying in a way that reflects shared goals. This might be, for example, an agreement to build principles of fairness into their reward systems (whether this be based on equity, equality, or need). Academic researchers and projects like this are key to supporting that.

What kinds of challenges has the project team encountered in doing its work?

The biggest challenge was related to the emotive and sensitive nature of the topic. We uncovered some excellent examples and cases where organizations were doing innovative and creative things to underpin their reward policies with fairness, but many of them we are not able to discuss in detail for reasons of confidentiality. Organizations were often happy to share with us their strategies, but only under condition of anonymity, even when their strategies were among the most progressive in our study. For example, of the 15 organizations we interviewed, three have revised their reward packages to eradicate the dual salary system, and have now put all employees on a single scale (which is often based on a blend of national and international salary benchmarking data). Of those three organizations, only one was willing to be profiled as a case study, or even to be named. This hesitancy to discuss how people are being rewarded contributes to a general feeling within the sector that there is much less movement toward addressing reward disparities than is actually the case.

What do you see as the next steps, either for Project FAIR or beyond the current project?

There is so much we as researchers can do to contribute to positive change in the context of managing human resources in INGOs, in particular there is a relative lack of research examining the experiences of host country national employees. Given the importance the international aid and development sector places on building national capacity, this might be even more important in this sector than in others. In terms of reward fairness, we are currently in the process of developing a toolkit for organizations to use as they work through the process of considering change in their reward systems, and we are engaging in longitudinal evaluation of changes in some organizations. From a research perspective we are exploring what fairness actually means for reward in INGOs (this might be a context where need is more important than equality or eq-

uity, for example). I'm also planning a project that explores employee identity, reward expectations, and motivation for working with INGOs, to help to provide a clearer picture of the people working in the sector. Finally, I'm working to develop company sponsored dissertations for MSc students at my university to work on projects defined by INGOs. This is a win-win for students and INGOs, and is a lot of demand from students for prosocially-oriented work.

Beyond the project itself, we need to find ways to actively contribute to the UN SDGs –there is a wealth of opportunity for I-Os to get involved with this, and an interest from INGOs and multilateral organizations to use our skills to help them. The SDGs are a further justification for why they should do so. SIOP is already making great inroads into this through the UN team, but there are other options in our own research agendas to align with the SDGs and therefore to make contributions individually too.

Do you have any advice for TIP readers who might want to get involved in working with NGOs?

My number one piece of advice is to prioritize relationships. People move around a lot so it can be a challenge to retain collaborations with organizations that are long term, but building relationships and becoming part of the network enables a broader connection with the sector. The ability to be mobile is also useful, and in particular taking the opportunities to meet people in person is really valuable.

On the topic of relationships, if you are interested in getting involved in some of the work of the Project FAIR team, please don't hesitate to get in touch (ishbel.mcwha@ed.ac.uk)!

Is there anyone you particularly want to recognize for their work on Project FAIR?

This project has been a true collaborative effort, and is underpinned by a fantastic team spread around the globe – though our geographic dispersion means scheduling meetings is often a challenge! Working alongside me at the University of Edinburgh are Dr Jakov Jandric and Emily Cook-Lundgren, and we are very lucky to receive ongoing expert advice from Prof Stu Carr at Massey University in New Zealand. We are also joined by colleagues from two practitioner organizations – firstly, Sam Wakefield from CHS Alliance, a network organization focused on the humanitarian and development sector, and secondly, Curtis Grund from Birches Group, who offer expert compensation benchmarking and advice to the NGO sector.

Thanks so much, Ishbel, for taking the time to share your thoughts and experiences on Project FAIR with *TIP's* readers!

And speaking of the readers, if there are topics within the humanitarian sphere that you want to know more about, send me an email, either direct (mullins@xavier.edu) or by reaching out to the GOHWP executive board through our website (<http://www.gohwp.org>). We know that many of you are engaged in interesting and important work in the humanitarian sector, and would love to help you get the word out!

The Results Are In! Updated Alternative I-O Graduate Program Rankings

Nicholas P. Salter, Joseph A. Allen, Allison S. Gabriel, Loren Naidoo, and David Sowinski

In the summer of 2016, we issued a Call for Proposals to submit unique and innovative methodologies to rank I-O graduate programs. In response to this, many projects were proposed to us. After much hard work (and the broader SIOP community's help), the five selected projects have been completed. Each of these five papers are included in the current issue of *TIP*. We believe each of these papers will be an important contribution to our field and will guide individuals in the future – as well as generate much thought and discussion about the state of our field and the programs that educate the future of IO Psychology. In particular, we hope that these rankings will result in graduate programs examining themselves and thinking about ways they excel, as well as areas they could improve. Additionally, we hope that future undergraduate students applying to I-O programs will use these rankings, not to determine what the “best” programs are, but which programs are the best fit for them.

Project Description and Findings

The original goal of this project was to highlight alternative ways of ranking (and more generally: examining) I-O graduate programs. Previous rankings primarily focused (though not exclusively) on research productivity. Although this is an important index of graduate program success, it is not the only marker. Other ways of measuring the strengths of graduate programs are difficult to operationalize as well as execute. To this end, the current five projects answered this call to determine nontraditional ways of determining the strengths of graduate programs, as well as to compare schools against each other. We saw this project as an opportunity to widen the scope of how we as a field determine “success” in graduate programs, and to generally celebrate the various strengths different graduate programs offer.

The process through which these projects were completed sought to strengthen each project as much as possible, as well as ensure that the rankings reflected the included graduate programs as much as possible. First, authors submitted their proposals to the reviewer committee (the authors of this paper). The reviewer committee was carefully composed to ensure diversity of program types, practitioners and academics, and those with graduate program education experience were included. The reviewer feedback was incorporated into the projects, and then the authors were given approximately one year to collect their data and write their manuscripts. Once again, their manuscripts were sent to the reviewers for feedback, and revisions were made. Through this process, multiple people were involved to ensure the quality of the projects were as high as possible.

The first two papers examine master's programs, an area understudied by previous graduate rankings. Vodanovich et al. (2018) examined objective, quantifiable indicators of master's program success, such as how much applied experiences students in the program receive, how much faculty are involved with applied work, job and internship placement rate, and number of courses students take in various topics. To gain this information, the authors of this project surveyed master's program directors. The second project, conducted by Acikgoz et al. (2018), also examined master's programs but instead focused on student and alumni perceptions of programs. The inclusion of the alumni perspective made this project especially unique; master's program directors were asked to forward the survey to recent alumni who had graduate within the past 5 years. These respondents helped give a different view on the programs than other respondents, thus adding a more nuanced understanding of program quality.

The third paper, authored by Landers et al. (2018), examined research productivity through a different lens than has been used previously. Instead of solely looking at the quantity of publications and/or conference presentation, this paper examines the interdisciplinarity of research output coming from graduate programs. This paper looks at how often faculty from graduate programs are publishing papers outside of the traditional core I-O journals, which provides an interesting way of thinking about scholarly output especially in addition to the previously published graduate rankings that focus on the quantity of publications and presentations.

The next paper, Howald et al. (2018) compared student perceptions of particular aspects of their programs with how subject matter experts in the field rated these aspects. The aspects they examined related to applied, teaching, and research developmental opportunities. The subject matter experts they surveyed in their study was the broad SIOP community; SIOP members rated the importance of various developmental opportunities graduate students may receive, and this was compared to whether or not current graduate students perceived these developmental opportunities to be available for them. Similarly, the final paper by Roman et al. (2018) also examined student perceptions of graduate programs. This paper looks broadly at multiple aspects of perceived program quality, including funding opportunities, class offerings, and general program culture.

In sum, the set of papers included in this volume cover a wide range of rankings. These include rankings of masters and doctoral programs from a variety of angles, such as students' perceptions as well as more objective indicators (e.g. interdisciplinary research productivity). The hope is that, in addition to traditional rankings, these additional perspectives provide more insight into the strengths and growth areas of the educational environment of IO Psychology across the field.

Caveats and Conclusions

Overall, we are pleased with the results of these projects and are excited to share the results with the SIOP community. A few caveats and considerations should be mentioned, though. First, response rate limited many of these projects; programs could not be included if there was not enough data on it. For some of the projects (i.e., those that averaged ratings of multiple people representing the program), a small response rate meant that the program was omitted from the ranking (in an effort to protect the confidentiality of those who did respond). A casual reader might see that a school was not included and implied that the school was poorly ranked, but this is not the case. Please keep this in mind as you are reading and interpreting the results.

Also, it is important to remind the reader that although we believe these rankings provide unique and interesting ways of operationalizing and examining various program strengths, these are not the only methods of doing so. The premise of this endeavor was that there are multiple ways of ranking graduate programs not just research productivity. Therefore, it would be disingenuous for us to say that we have created a definitive list of all the ways graduate programs can excel. We acknowledge that there are many more ways graduate programs could have been analyzed and ranked, and we hope that these five papers will spark discussions among I-O psychologists about other program aspects that should be emphasized.

In fact, we hope that these papers spark multiple discussions among individuals in our field, not just about what else could have been examined, but just generally what people think about these rankings. What do you agree with? What do you disagree with? If you would like to join in on the discussion, we encourage you to attend our session at the 2018 SIOP conference entitled "Where Do We Stand? Alternative Methods of Ranking I-O Graduate Programs." This session will be on Friday, April 20 from 11:30 – 12:50 in the Gold Coast room. The format of the session will be that the project authors will give a brief overview of their findings, the reviewer committee will discuss the findings, and then the audience will be open to ask questions and offer their thoughts. We hope to see you there!

Ranking I-O Master's Programs Using Objective Data From I-O Coordinators¹

Stephen J. Vodanovich, Valerie J. Morganson, & Steven J. Kass
University of West Florida

Past I-O psychology program ranking surveys have differed in a number of respects such as sample type and size (e.g., faculty, students), type of data collected (e.g., objective, subjective), and number of programs ranked, the majority focused on ranking doctoral programs based on research productivity (Beiler, Zimmerman, Doerr, & Clark, 2014; Gibby, Reeve, Grauer, Mohr, & Zickar, 2002; Oliver, Blair, Gorman, & Woehr, 2005; Payne, Succa, Maxey, & Bolton, 2001; Winter, Healy, & Svyantek, 1995). An exception is the research of Kraiger and Abalos (2004) who surveyed masters and doctoral students with a focus on nonresearch factors (e.g., instruction quality, faculty support, funding, class size).

Given that previous survey research focused on doctoral programs and research output, our proposal extended current rankings by concentrating on *master's level* programs and on *applied experiences*. Additionally, we relied upon objective data. The highlighting of applied experience seemed warranted given that applied skills are arguably more pertinent to ranking MA/MS programs as compared to assessing doctoral training. Indeed, past research on master's I-O programs have discussed the vital role of application of classroom material through such mechanisms as consulting projects and internships (e.g., Hays-Thomas & Kass, 2003; Lowe, 1993; Kottke, Shoenfelt, & Stone, 2014; Schneider, Piotrowski, & Kass, 2007; Shoenfelt, Kottke, & Stone, 2012; Shoenfelt, Stone, & Kottke, 2013). Also, the focus on application is consistent with SIOP's *Guidelines for Education and Training*, which recognizes that graduates of master's programs are more likely to be consumers of I-O research (e.g., using the literature to solve work-related problems) than they are to be researchers themselves. We wrote items, a priori, to assess the following dimensions: (a) applied experience, (b) curriculum, (c) faculty experience/information, and (d) student accomplishments/information. We discuss each of these dimensions and their rationale below.

Applied Experience

The first, quintessential dimension—applied experience—reflects the degree to which students are engaged in various real-world opportunities to use their I-O skills. These include the availability of applied projects, internships, and the presence of a consulting unit. Such activities provide enriching applied experiences for graduate students (e.g., Byrne et al., 2014; Dickson & Mullins, 2016; Kottke et al., 2014).

Curriculum

Curriculum is inherently critical to ranking educational programs. The curriculum dimension included number of credit hours, I-O-related credit hours, time to graduation, proportion of students who graduate on time, and course offering. Our assessment of I-O masters programs' course offerings was based on past work that identified the importance of specific courses and competencies for graduate study. This work included the SIOP *Guidelines for Education and Training in Industrial Organizational Psychology* (2016) as well as other relevant research (e.g., Erffmeyer & Mendel, 1990; Tett, Walser, Brown, Simonet, & Tonidandel, 2013; Trahan & McAllister, 2002).

Faculty Experience/Information

In parallel to historical rankings that have assessed programs based on faculty research productivity (see citations above), faculty applied experiences and qualifications are a component of our ranking procedure. Faculty applied experience was included to help applicants evaluate the type of mentoring they can expect in a program. One might expect that faculty who themselves have engaged in applied experiences (e.g., consulting clients) would be better able to supervise students who are engaged in hands-on experiences (e.g., fieldwork, internships, projects) by modelling the expected behavior. This is the educational approach suggested in the *SIOP Guidelines* (2016) for building professional competence. Faculty experiences/information included faculty-to-student ratio, proportion of faculty who engage in consulting, and proportion of faculty who supervise consulting projects. Because scholarship is essential to quality applied intervention, we also included an item to reflect faculty research productivity.

Student Accomplishments and Information

The assessment of student accomplishments evaluates programs in terms of what applicants could expect while matriculating (e.g., assistantships) as well as upon graduation (e.g., obtaining jobs). To the extent that strong students help attract and retain other strong students and build the reputation and human capital of a program, student accomplishments can be viewed as an indicator of program quality (cf. Schneider, 1987). Perhaps more intuitively, student accomplishments can be viewed as an outcome of program quality. Therefore, we decided to present program rankings on the student accomplishments/information dimension as well as an outcome of the other three factors that we measured. Student accomplishments/information included items concerning percentage of non-doctoral-bound students who obtain an I-O job within a year, active participation in I-O-related student chapters, assistantships, graduation rates, and presentations at conferences.

Method

Participants, Procedure, and Instrumentation

Prior to administering the survey, the project was approved by the university's institutional review board. After receiving the contact information for each of the 127 coordinators of I-O MA/MS programs from SIOP, we sent emails to each coordinator with a brief description of our research, informed consent, and a link to our survey in Qualtrics. We surveyed coordinators of terminal master's programs as well as MA/MS programs contained within doctoral programs. Weekly reminders were sent to coordinators to increase the response rate. These updates targeted coordinators who had not yet begun the survey or whose survey responses were incomplete. Overall, coordinators were allowed approximately 6 weeks to complete the survey. This extended time was provided because several items required coordinators to assess archival data (e.g., graduation rates) in order to provide accurate responses.

Our final sample consisted of 69 completed surveys for a response rate of 54%.² Degree types included MS (47.8%), MA (44.9%), or other degree (7.2%; e.g., both MA and MS, MPS). The vast majority (92.8%) of respondents indicated that their program was located within psychology. Programs embedded within public institutions (68.1%) were more prevalent than programs within private institutions (31.9%). Whereas 69.6% of respondents indicated that they did not have a doctoral program, 30.4% did. The ma-

jority of respondents reported having a face-to-face program (81.2%), but our sample also included hybrid programs (10.1%) and exclusively virtual programs (8.7%). With the exception of two programs, respondents were located at universities within the United States.³

The final survey consisted of 53 questions. The items were written and placed into the four dimensions noted earlier for ranking purposes: applied experience, curriculum, faculty expertise/information, and student accomplishments/information. Additional items assessed "demographic" program data that were not used for ranking purposes (e.g., faculty diversity, job tenure, private or public university). At the end of our survey, we provided a link to a page provided by a team of researchers at Appalachian State University who were conducting a different ranking survey for SIOP.

The items on the survey were developed using several factors. One was the inclusion of items to collect program data that are regularly reported by SIOP via input from program coordinators, (e.g., number of I-O faculty, graduate employment, average program completion time). Other items were written to be consistent with previous surveys (e.g., Tett et al., 2013) and SIOP's 2016 *Guidelines for Education and Training in Industrial-Organizational Psychology* (e.g., curriculum coverage, applied focus for MA/MS programs). Finally, the items were reflective of those contained in previous program ranking surveys, such as applied experience, coursework, financial aid, and student research opportunities (Bulger, Horvath, & Zickar; Kraiger & Abalos, 2004). We originally planned to conduct a pilot study from a random sample of I-O coordinators to assist in item construction, but the tight timeframe for data collection made this approach untenable.

Because items varied in terms of response format (e.g., ordinal categories, continuous data), all responses were scaled from 0 to 1 in order to sum items into category scores. For example, responses were assigned point values (e.g., 0 to 5) based on higher scores being indicative of greater quality (e.g., number of hours needed for internships, total I-O related hours required, total program hours, number of I-O faculty). Points were then divided by the number of options that were available on each item. Further, items that asked about proportions were divided by 100 (e.g., percent of I-O students who graduate, percent of students who do an internship). Items were averaged together to create category scores on which programs were ranked. Finally, category scores were combined to provide an overall ranking. Data cleaning was informed by content coding of qualitative write-in responses, referencing the SIOP program database, and in some cases, replying to emails from respondents.⁴ For instance, in order to enhance the accuracy and consistency of survey responses, we responded to several emails to clarify the meaning of various items.

Results

Means, standard deviations, and intercorrelations among dimensions are presented in Table 1. Programs were ranked on each of the scale facets as well as overall. Top five rankings for each dimension are presented in Tables 2 to 5. As indicated earlier, we also regressed Student Accomplishments/Information onto each of the other facets: Applied Experience ($\beta = .29$, $p = .02$, $R^2 = .08$), Curriculum ($\beta = .29$, $p = .02$, $R^2 = .09$), and Faculty Expertise/Information ($\beta = .35$, $p = .02$, $R^2 = .12$). Each significantly predicted Student Accomplishments/Information. The top ten rankings overall—an average across the four dimensions—is presented in Table 6.

Table 1

Means, Standards Deviations, and Intercorrelations Among Dimensions

	<i>M</i>	<i>SD</i>	1	2	3	4	5
Applied experience	.59	.20					
Curriculum	.71	.15	.31**				
Faculty experience/information	.52	.17	.28*	.18			
Student accomplishments/information	.66	.16	.29*	.29*	.35**		
Overall	.62	.11	.73**	.63**	.67**	.69**	

Note. * $p < .01$ ** $p < .001$

Table 2

Rankings of Programs Top 20 Institutions/Programs for the Applied Experience Dimension

Institution/program	Ranking score (0 to 1)	Z-score
Minnesota State University, Mankato	.94	1.83
University of West Florida	.93	1.77
University of Detroit Mercy	.90	1.61
Middle Tennessee State University	.90	1.60
St Mary's University	.90	1.58
Southern Illinois University at Edwardsville	.89	1.54
San Francisco State University	.88	1.51
Saint Cloud State University	.88	1.51
Valdosta State University	.87	1.43
Florida Institute of Technology	.83	1.26
George Mason	.83	1.23
William James College	.82	1.20
Angelo State University	.81	1.15
University of Texas at Arlington	.78	.97
Roosevelt University	.76	.89
University of Tennessee at Chattanooga	.75	.83
California State University, Long Beach	.75	.83
Western Kentucky University	.72	.67
Emporia State University	.72	.66
Springfield College	.71	.62

Table 3

Rankings of Programs Top 20 Institutions/Programs for the Curriculum Dimension

Institution/program	Ranking score (0 to 1)	Z-score
University of Tennessee at Chattanooga	.94	1.50
Middle Tennessee State University	.90	1.25
University of New Haven	.88	1.13
Appalachian State University	.88	1.12
California State University, San Bernardino	.88	1.10
Hofstra University	.87	1.02

Carlos Albizu University-Online	.85	.91
Minnesota State University, Mankato	.84	.88
Carlos Albizu University-Miami	.84	.85
South Dakota State University	.84	.84
Iona College	.83	.77
San Francisco State University	.82	.70
Salem State University	.82	.68
Xavier University	.81	.67
St Mary's University	.81	.66
University of Georgia	.81	.64
Florida Institute of Technology	.80	.61
University of Detroit Mercy	.80	.60
Valdosta State University	.80	.60
Lamar University	.80	.59

Table 4

Rankings of Programs Top 20 Institutions/Programs for the Faculty Experience/Information Dimension

Institution/program	Ranking score (0 to 1)	Z-score
Illinois State University	.90	2.22
Florida Institute of Technology	.76	1.39
University of Tulsa	.75	1.34
Appalachian State University	.74	1.28
University at Albany, SUNY	.73	1.23
Saint Mary's University	.71	1.13
Minnesota State University, Mankato	.70	1.04
George Mason	.70	1.04
Southern Illinois University at Edwardsville	.70	1.04
Elmhurst College	.70	1.02
Middle Tennessee State University	.70	1.02
Eastern Kentucky University	.69	.97
Central Michigan University	.69	.96
Colorado State University	.68	.90
Radford State University	.67	.85
University of Oklahoma	.67	.85
Wayne State University	.66	.80
Western Kentucky University	.66	.79
Xavier University	.65	.75
San Diego State University	.64	.71

Table 5

Rankings of Programs Top 20 Institutions/Programs for the Student Accomplishments and Information Dimension

Institution/program	Ranking score (0 to 1)	Z-score
South Dakota State University	1.00	2.15
Middle Tennessee State University	.97	1.96
Southern Illinois University at Edwardsville	.94	1.76
University of Minnesota Duluth	.92	1.65
Central Michigan University	.87	1.34
San Diego State University	.87	1.31
Saint Mary's University	.86	1.23
Lamar University	.85	1.19
Appalachian State University	.84	1.14
Illinois State University	.84	1.13
Minnesota State University, Mankato	.84	1.13
Western Kentucky University	.83	1.05
University of Central Florida	.81	.92
University of Nebraska at Omaha	.80	.89
Florida Institute of Technology	.79	.82
University of Oklahoma	.79	.81
Eastern Kentucky University	.77	.68
Radford State University	.77	.66
Indiana University Purdue University Indian- apolis	.76	.59
University of Tulsa	.75	.57

Table 6

Overall Rankings of Top 20 Institutions/Programs

Institution/program	Ranking score (0 to 1)	Z-score
Middle Tennessee State University	.87	2.14
Minnesota State University, Mankato	.83	1.84
Florida Institute of Technology	.80	1.54
Southern Illinois University at Edwardsville	.77	1.33
University of West Florida	.76	1.23
University of Tennessee at Chattanooga	.76	1.19
Saint Cloud State University	.76	1.18
Appalachian State University	.75	1.15
George Mason	.75	1.10
Western Kentucky University	.75	1.09
St Mary's University	.74	1.06
San Francisco State University	.74	1.05
University of Detroit Mercy	.73	.93
University of Central Florida	.72	.90

California State University, San Bernardino	.71	.80
Central Michigan University	.71	.76
San Diego State University	.70	.73
Eastern Kentucky University	.70	.72
Illinois State University	.69	.64
Angelo State University	.69	.63

Discussion

This project presents a contribution to SIOP and potential graduate students. Specifically, past program rankings have primarily assessed academic factors that are more relevant to doctoral-level education. However, a strength of the current study is that it focused on applied factors, which are more applicable to the mission of I-O master's programs and more pertinent to graduates who are likely to become practitioners. Also, besides providing an overall program ranking, our results offer rankings on four specific, relevant program dimensions. This approach was a major focus of our survey, which was to provide prospective students with a useful way to view the quality of master's programs on multiple dimensions. As such, this article provides students with a resource to help them choose the right program for them based on the dimensions they consider to be most important. That is, they can decide whether to focus on overall program rankings or emphasize specific program components (e.g., applied experience, curriculum). Our findings can also be used as a benchmark for I-O faculty who want to build or enhance their programs while also allowing them to emphasize key, positive programmatic features to appropriate audiences.

Strengths and Limitations

Our project has limitations as well as strengths. Ideally, formative measures should be identified and validated with criterion-related validity evidence using structural equation modeling (e.g., Diamantopoulos, Reifler, & Roth, 2008). However, our sample size and project scope did not permit such a validation effort. Regression results and facet intercorrelations, however, provide some evidence of criterion-related validity. The content of some items could be considered as being related to more than one category. This was especially true regarding the "applied experience" and "curriculum" dimensions. For instance, questions about practicums, internships, and the number of courses requiring formal presentations were included under the "applied experience" category, although they can also be considered as part of a program's curriculum. Also, as noted before, our student accomplishments/information dimension contained program factors (e.g., availability of graduate assistantships) as well as program "outcomes" such as gaining employment after graduation and graduation rates. Our regression analysis partly addressed this issue by using student accomplishments/information as an outcome variable. Regardless of how this dimension is conceptualized, its contents are likely to be considered by students in evaluating the quality of I-O master's programs.

Our survey required answers to objective items. However, it is possible that some I-O coordinators may have interpreted the meaning of various questions differently (e.g., what qualifies as an internship or an applied project, the extent to which various topics are covered in the curriculum). Also, certain data may not have been readily available to coordinators (e.g., what percentage of graduates receive an I-O –

related job within a year, what percent of I-O students presented papers at conferences). If so, the accuracy of the responses could be an issue. Regarding the latter point, I-O programs would benefit if their coordinators established mechanisms to track and assess program quality and indicate areas for improvement. Finally, some programs were too new to adequately answer many of the survey questions (e.g., graduation rate). Therefore, they were not included in our rankings.

A strength of our project was its focus on objective, quantifiable factors rather than potentially biased opinions of satisfied (or dissatisfied) respondents. We tried to include data that most program coordinators would likely be collecting as they assess and track their own programs. Finally, at 54%, our response rate was quite respectable, thus adding to the representativeness of our findings. With more and more programs competing for qualified students, we expect that future updates to the rankings will include data from all available programs. The survey results could help guide decision makers (e.g., curriculum, applied experiences) in taking steps to improve their individual programs. It is our hope that the discrete, objective information contained in our results will be combined with additional subjective data that will allow prospective students to identify programs that best fit their interests and career goals.

Notes

¹ The authors wish to thank Skye Evans and Michael DeNoia for their assistance on this project.

² Eleven surveys were partially completed and were not included in the analyses.

³ In one case, an international university's response had to be omitted for the curriculum dimension because they used a points system rather than a credit hour system; no conversion was available.

⁴ Data were extensively cleaned prior to analysis. Additional detail on specific data cleaning decisions is available upon request from the authors.

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Appendix A

Items Used to in Rankings by Facet

Applied Dimension

1. Responses were combined on the following two questions:
 - a. Does your I-O program contain a formalized, applied internship within your curriculum?
 - b. How many hours are required to successfully complete the internship? If variable, provide an average. Type in number of hours.
2. Typically, what percent of students perform an internship?
3. Does your program allow for students to enroll in a practicum?
4. Does your program have a designated unit (e.g., consulting clinic, center) to acquire consulting contracts and/or grants?
5. How many courses in your program, including an internship, if applicable, involve students conducting applied projects (e.g., job analysis, training programs, organizational development) outside of the classroom?
6. How many courses in your program require formal presentations (group or individual) designed for applied audiences?

Curriculum Dimension

1. Responses were combined on the following two questions:
 - a. How many total credit hours are required for your I-O MA/MS degree? Please indicate in semester hours (1.5 quarter hours = 1 semester hours).
 - b. Given the number of hours in your program, what percent of MA/MS students graduate in the expected timeframe (e.g., "on time")?
2. How many I-O-related hours (including research methods and statistics) are required for your I-O MA/MS degree? Please indicate in semester hours (1.5 quarter hours = 1 semester hours).
3. To what extent are the following topics covered in your program? Use the guidelines listed below in providing your answers: (0 = *never*: not covered at all, .5 = *somewhat*, 1 = *extensively*). [job analysis, personnel recruitment/selection, training and development, performance appraisal, job evaluation/compensation, employment law, work motivation, work attitudes, work groups/teams, leadership/management, judgment/decision making, organizational development, organizational theory, work/family, work stress, human factors, consulting/business skills, workforce diversity, workforce aging, individual differences in the workplace]

Faculty Information/Experience

1. Faculty to student ratio
 - a. How many I-O faculty teach in your I-O program? (three-quarter appointments count as .75; half-time appointments count as .5; one-third appointments count as .3; Do not count adjunct instructors)
 - b. This was divided by responses to the following question: What number of students typically enter your I-O program each year?
2. What number of I-O faculty in your program have worked on a consulting project in the past 5 years? (This was divided by the number of I-O faculty who teach)
3. How many I-O faculty have supervised I-O students on external consulting projects? (This was divided by the number of students enrolled annually)
4. How many total articles have been published by your I-O faculty in refereed journals from 2012 to 2016, including "in press" articles?

Student Accomplishments/Information

1. Of the graduate students who do not pursue doctoral degrees, what percentage obtain work in an I-O-related job within a year after graduation?
2. What percent of current I-O graduate students are active participants in I-O related student chapters (e.g., SHRM, ATD, IOPSA)?
3. What percent of current I-O graduate students received assistantships?
4. Of those who enroll in your program, what percent of your I-O students graduate?
5. What percentage of your MA/MS students have presented a paper or poster at a regional, national, or international conference in the past 5 years?

**The Cream of the Crop:
Student and Alumni Perceptions of I-O Psychology Master's Degree Program Quality**

**Yalcin Acikgoz, Timothy J. Huelsman, Jessica L. Swets, Amanda R. Dixon,
Stephanie N. Jeffer, D. Ryan Olsen, and Amanda Ross
Appalachian State University**

Author Note: First three authors are listed based on contribution. Remaining authors are listed based on alphabetical order. Correspondence concerning this paper should be addressed to Yalcin Acikgoz, Department of Psychology, Appalachian State University, Box 32109, 222 Joyce Lawrence Ln., Boone, NC (28608). Email: acikgozy@appstate.edu. Phone: +1-828-262-8926

There is little dispute that reputation is a factor in a prospective student's decision to apply to a specific graduate program in industrial-organizational (I-O) psychology. Consequently, there have been many attempts at ranking graduate programs. However, the vast majority of these have examined doctoral-level programs and have used research productivity as the main criteria (e.g., Beiler, Zimmerman, Doerr, & Clark, 2014; Gibby, Reeve, Grauer, Mohr, & Zickar, 2002; Oliver, Blair, Gorman, & Woehr, 2005; Payne, Succa, Maxey, & Bolton, 2001; Winter, Healy, & Svyantek, 1995). Especially for master's level graduate programs, subjective program experience may be an important consideration for prospective students when evaluating the desirability of a graduate program. An example of this kind of program evaluation is Kraiger and Abalos (2004), but it has been more than a decade since the publication of their results, and an update is long overdue. This project attempts to remedy past neglect and provides rankings of master's level I-O graduate programs using subjective ratings provided by students and alumni (a companion report in this issue, Vodanovich, Morganson, & Kass, provides a ranking of master's degree programs based on objective criteria).

Our project was prompted by a call for proposal by SIOP (Salter, Allen, Gabriel, Sowinski, & Naidoo, 2016). A major goal of this effort was to identify more comprehensive ways of ranking programs using the criteria that would be important to prospective students. We took this as a call to further develop subjective criteria to rank master's level programs and decided on three main indicators of program quality that would be evaluated by each program's current students. First, there has been a wide range of research supporting the importance of culture in educational success (Pritchard, Morrow, & Marshall, 2005; Tichnor-Wagner, Harrison, & Cohen-Vogel, 2016) as well as business success (Sirota, Mischkind, & Meltzer, 2008; Xenikou & Simosi, 2006). Similarly, we believe having a supportive and warm culture in graduate school is important in creating a superior professional development experience. Accordingly, the first subjective indicator is *program culture*. Second, we measured *program resources* via students' perceptions of resources such as program faculty, breadth of program curriculum, funding opportunities, and availability of academic and professional mentoring. This offers a more in-depth examination of resources beyond typical research and faculty availability. Finally, the third indicator of program quality examined in this study is *student satisfaction*. We believe that a good program results in a high level of overall satisfaction with the experience it offers.

In addition to expanding the scope of criteria to include subjective evaluations, we believe that another way to ensure comprehensiveness of graduate program rankings is by making sure numerous stakeholders provide input in the process. Although current students offer an important viewpoint, they cannot provide feedback for all relevant graduate program characteristics. An additional group of key stakeholders are program alumni, as these individuals are in a better position to evaluate how their programs prepared them for the "real world." Accordingly, we included *alumni perceptions* of the program as a

separate dimension of graduate program rankings. However, in order to reach alumni who had a good memory of their programs and following job search experiences, we limited our alumni sample to those who graduated in the last 5 years. This also allowed us to collect data from alumni who have been in the program relatively recently and thus are likely knowledgeable about the current state of the program (i.e., their perceptions would better reflect the outcome of the program in its current form). Finally, two separate surveys were created, one for each group of informants. The first survey, for current students in I-O master's degree programs, included items assessing program culture, program resources, and satisfaction. The second survey, for recent program alumni, included items assessing whether the program was successful in preparing them for employment.

Method

Procedure

After reviewing the existing literature on organizational culture, performance, and satisfaction measures, the research team developed surveys targeted at I-O programs' current students and recent alumni. For each dimension, the team created a list of items based on other measures when possible (e.g., Bierer, Fishleder, Dannefer, Farrow, & Hull, 2004; Kraiger & Abalos, 2004; O'Reilly, Chatman, & Caldwell, 1991). Survey items used in the current study are in Appendix A. Email addresses for 117 master's degree program directors were obtained from SIOP, and each program director was sent an email containing information about the project and a request to forward the appropriate survey link to current students and recent alumni (i.e., former students who graduated within the last 5 academic years, as of spring 2017).

Student Survey

Program culture.

Student perceptions of program culture was measured by 14 items written for this study based on organizational culture profile items described in O'Reilly et al. (1991). Participants were asked to indicate their level of agreement regarding program cultural elements on a five-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Sample items include: "I am able to achieve a balance between my work in the program and life outside the program" and "This program is accepting of people from various backgrounds and perspectives." Cronbach's alpha for internal consistency is .92 in the current sample.

Program resources.

Student perceptions of program resources were measured by 13 items adapted from Bierer et al. (2004). Participants were asked to indicate the extent to which their program offers access to a variety of resources on a five-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. After the prompt "My program offers me access to...", the survey referenced a variety of resources including career development services, statistical software, and program alumni. Cronbach's alpha for internal consistency is .88 in the current sample.

Program satisfaction.

Students' satisfaction with their programs was measured by 18 items developed for this study. Participants were asked to indicate the extent to which they are satisfied with several aspects of the program on a five-point scale ranging from 1 = *very dissatisfied* to 5 = *very satisfied*. The survey noted program characteristics such as class sizes, course offerings, and internship opportunities. Cronbach's alpha for internal consistency is .93 in the current sample.

Alumni Survey

Alumni perceptions of the program were measured using nine items developed for this study. Participants were asked to indicate the extent to which they agree with statements on a five-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Sample items include “I feel the program has prepared me well for my career” and “I would encourage others to apply to this program.” Cronbach’s alpha for internal consistency is .87 in the current sample.

Results

As described above, the goal of this study was to produce rankings of I-O master’s degree programs by using subjective evaluations of students and alumni. A total of 975 participants provided the data for the study: 594 current students from 44 programs and 381 alumni from 36 programs. However, some programs had very little data on which to base the rankings. For these programs, one or two individuals with very high or very low evaluations could potentially skew their mean score and unduly influence their program ranking. To avoid this possibility, we excluded programs from the rankings if they had a sample size less than one SD below the mean for each informant group (Kraiger & Abalos, 2004). The mean sample size across programs was 13 for students ($SD = 8.4$) and 11 for alumni ($SD = 8$). Thus, programs were included in the rankings if they had at least five student respondents and at least three alumni respondents, which led to the elimination of six programs from the student survey and 12 programs from the alumni survey.

The rankings for student evaluations of program culture, program resources, and satisfaction with the program appear in Tables 1-3, respectively. We only included the 25 highest-ranked programs in the results (see Appendix B for a complete, nonranked list of all programs from which we received any responses). As seen in Table 1, the top three schools in program culture are Indiana University-Purdue University Indianapolis ($M = 4.83$, $SD = .15$), Appalachian State University ($M = 4.77$, $SD = .19$), and Xavier University ($M = 4.75$, $SD = .26$). As seen in Table 2, the top three schools in program resources are Appalachian State University ($M = 4.63$, $SD = .32$), Minnesota State University–Mankato ($M = 4.55$, $SD = .54$), and Indiana University-Purdue University Indianapolis ($M = 4.54$, $SD = .27$). As seen in Table 3, the top three schools in student satisfaction are Appalachian State University ($M = 4.69$, $SD = .28$), Missouri State University ($M = 4.66$, $SD = .27$), and San Diego State University ($M = 4.60$, $SD = .37$).

Next, we examined evaluations by program alumni. As seen in Table 4, the top-three programs in this ranking were The University of Georgia ($M = 4.65$, $SD = .25$), University of Maryland–Baltimore County ($M = 4.63$, $SD = .17$), and Minnesota State University-Mankato ($M = 4.61$, $SD = .44$). Finally, we examined the extent to which ratings by students on different dimensions and alumni ratings overlapped. This was done by creating a separate dataset of program means on each dimension (with programs being the level of analysis) and examining the correlation between means of ratings in separate dimensions. As seen in Table 5, all the correlations were strong and statistically significant, especially among student-rated dimensions. The most noteworthy correlations were correlations between alumni ratings and different dimensions of student evaluations. The correlations between alumni evaluations and student evaluations of program culture, resources, and satisfaction were .49 ($p < .01$), .39 ($p < .05$), and .45 ($p < .01$), respectively.

Table 1
Program Rankings by Student Perceptions of Program Culture

Rank	Program name	<i>M</i>	<i>SD</i>	<i>N</i>
1	Indiana University-Purdue University at Indianapolis	4.83	0.15	5
2	Appalachian State University	4.77	0.19	24

3	Xavier University	4.74	0.26	14
4	University of Maryland	4.71	0.25	19
5	Missouri State University	4.66	0.30	17
6	San Francisco State University	4.65	0.29	12
7	The University of Tennessee at Chattanooga	4.64	0.33	22
8	University of Hartford	4.60	0.23	8
9	Western Kentucky University	4.58	0.42	8
10	Minnesota State University-Mankato	4.53	0.77	18
11	St. Mary's University	4.52	0.50	15
12	San Diego State University	4.51	0.34	8
13	Florida Institute of Technology	4.45	0.43	27
14	Emporia State University	4.42	0.24	10
15	Eastern Kentucky University	4.39	0.47	5
16	Middle Tennessee State University	4.39	0.42	25
17	University of Baltimore	4.38	0.61	24
18	The University of Georgia	4.37	0.45	25
19	University at Albany, State University of New York	4.36	0.30	5
20	Saint Cloud State University	4.35	0.47	11
21	Albizu University	4.31	0.70	28
22	University of West Florida	4.30	0.56	5
23	University of New Haven	4.26	0.45	20
24	George Mason University	4.25	0.52	15
25	Roosevelt University	4.24	0.29	6

Table 2
Program Rankings by Student Perceptions of Program Resources

Rank	Program name	<i>M</i>	<i>SD</i>	<i>N</i>
1	Appalachian State University	4.63	0.32	24
2	Minnesota State University-Mankato	4.55	0.54	18
3	Indiana University-Purdue University at Indianapolis	4.54	0.27	5
4	Missouri State University	4.53	0.38	17
5	Xavier University	4.47	0.44	14
6	The University of Tennessee at Chattanooga	4.41	0.38	22
7	St. Mary's University	4.31	0.52	15
8	Western Kentucky University	4.28	0.38	8
9	University of West Florida	4.25	0.46	5
10	Saint Cloud State University	4.24	0.37	11
11	Middle Tennessee State University	4.18	0.47	25
12	Eastern Kentucky University	4.14	0.31	5
13	San Francisco State University	4.13	0.36	12
14	San Diego State University	4.11	0.64	8
15	University of Maryland	4.08	0.59	19
16	University of Hartford	4.01	0.52	8
17	Valdosta State University	3.99	0.55	12
18	University of Minnesota-Duluth	3.91	0.55	8
19	University of Baltimore	3.91	0.55	24

20	University of Central Florida	3.91	0.66	14
21	Florida Institute of Technology	3.86	0.61	26
22	University of Nebraska-Omaha	3.85	0.60	23
23	Montclair State University	3.83	0.59	16
24	Emporia State University	3.80	0.52	10
25	The University of Texas at Arlington	3.78	0.55	12

Table 3
Program Rankings by Student Satisfaction

Rank	Program name	<i>M</i>	<i>SD</i>	<i>N</i>
1	Appalachian State University	4.69	0.28	24
2	Missouri State University	4.66	0.27	17
3	San Diego State University	4.60	0.37	8
4	San Francisco State University	4.58	0.37	12
5	Indiana University-Purdue University at Indianapolis	4.54	0.28	5
6	University of Maryland	4.53	0.40	18
7	Minnesota State University-Mankato	4.53	0.77	18
8	The University of Tennessee at Chattanooga	4.51	0.31	22
9	Middle Tennessee State University	4.51	0.42	25
10	Western Kentucky University	4.43	0.37	8
11	University of West Florida	4.38	0.25	5
12	Eastern Kentucky University	4.37	0.34	5
13	Xavier University	4.36	0.62	14
14	St. Mary's University	4.35	0.46	15
15	University of Hartford	4.32	0.47	8
16	University of Baltimore	4.32	0.64	23
17	Roosevelt University	4.30	0.59	5
18	Florida Institute of Technology	4.26	0.55	26
19	The University of Georgia	4.24	0.50	26
20	Albizu University	4.20	0.82	28
21	Southern Illinois University-Edwardsville	4.17	0.54	16
22	Touro College	4.16	0.87	24
23	Saint Cloud State University	4.13	0.50	11
24	George Mason University	4.12	0.68	15
25	University at Albany, State University of New York	4.10	0.55	5

Table 4
Program Rankings by Alumni Perceptions

Rank	Program name	<i>M</i>	<i>SD</i>	<i>N</i>
1	The University of Georgia	4.65	0.25	8
2	University of Maryland-Baltimore County	4.63	0.17	3
3	Minnesota State University-Mankato	4.61	0.44	8
4	Xavier University	4.58	0.28	4
5	Middle Tennessee State University	4.51	0.23	9
6	The University of Tennessee at Chattanooga	4.48	0.24	7
7	Indiana University-Purdue University at Indianapolis	4.44	0.61	19
8	Valdosta State University	4.37	0.42	3

9	Appalachian State University	4.36	0.36	8
10	Albizu University	4.29	0.39	20
11	California State University, San Bernardino	4.29	0.54	24
12	San Francisco State University	4.23	0.37	46
13	San Diego State University	4.22	0.29	3
14	George Mason University	4.17	0.59	9
15	University of Baltimore	4.17	0.56	4
16	Western Kentucky University	4.11	0.41	10
17	University of Central Florida	4.10	0.56	10
18	Missouri State University	4.07	0.52	8
19	University of West Florida	4.05	0.27	9
20	Florida Institute of Technology	4.01	0.73	16
21	Elmhurst College	3.99	0.45	8
22	The University of Texas at Arlington	3.98	0.59	7
23	University of Hartford	3.98	0.81	10
24	University of Nebraska-Omaha	3.91	0.73	11
25	East Carolina University	3.88	0.52	16

Table 5
Means, Standard Deviations, and Correlations of Study Variables

	1	2	3	4	5
1. Student culture mean	---				
2. Student resources mean	.66***	---			
3. Student satisfaction mean	.83***	.71***	---		
4. Student overall mean	.94***	.83***	.91***	---	
5. Alumni satisfaction mean	.49**	.39*	.45**	.51**	---
Mean	4.32	3.98	4.21	4.16	4.10
SD	0.29	0.33	0.32	0.29	0.31

* $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

The present report diverges from previous ranking attempts by incorporating subjective criteria such as culture, satisfaction, and program resources rather than relying only on research productivity outcomes. By doing so, the current study accomplishes two important objectives. First, it addresses issues that have a direct relevance to how students choose a master's program but have received little attention in the extant literature. For example, assessing students' perceptions of their program resources may provide an important context for whether prospective students believe they will be successful in a certain program. Second, it provides a more comprehensive examination of the overall effectiveness of master's programs by examining how programs prepare their students for their future careers based on subjective evaluations of program alumni. As described above, subjective evaluations of current students and alumni may be more important to prospective students compared to objective outcomes such as research productivity. Therefore, we believe these rankings are likely to be of significant value to prospective I-O graduate students who are engaged in the important decision of where to apply for graduate school.

It is important to note that the top three schools as ranked by their current students do not appear in the top three alumni ranked programs. This demonstrates the importance of evaluating program effectiveness from the perspectives of multiple stakeholders. Current students may have differing opinions

about their master's programs while they are in attendance as compared to after starting their careers. It is likely that satisfaction with their program after graduation may be influenced by factors other than those that are important for student experience. Factors such as the ability to find a job, how quickly they are hired, how well the program prepared them for work, the kinds of jobs they were able to find, or getting into a PhD program after graduating from a master's program may influence alumni perceptions of their programs. Future ranking efforts should continue including this important perspective in evaluations of graduate programs, perhaps even considering the kinds of jobs alumni take.

There were some limitations to this study, which largely focus around the availability of respondents and the use of subjective measures. Some programs have not been established long enough to produce a sufficient number of alumni to provide rankings. Some other programs were smaller in size and therefore had fewer current students to provide rankings. Accordingly, program age and size are important limitations that should be acknowledged. Another limitation is that due to the subjective nature of the evaluations sought, some program directors may have refused to provide data. Kraiger and Abalos (2004) mention concerns by program directors that some criteria would put them at an inherent disadvantage (e.g., program cost for schools in metropolitan areas) as one reason for some programs not being represented in the evaluations. Even though we did not receive any feedback from program directors with such concerns, this may be one reason for some programs not providing data to our evaluations. Regardless of reason, of 117 programs to which our efforts were directed, we received data from only 44 programs. However, despite these limitations, we believe the rankings reported here provide valuable information for potential graduate students and others interested in I-O master's degree program quality. We recommend that these rankings be used in conjunction with others, including those developed in response to SIOP's recent Call for Proposals (Salter et al., 2016). Together, these rankings provide a very comprehensive base for evaluating program success.

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APPENDIX A

Student Survey-Program Culture

Please indicate the extent to which you agree or disagree with the following statements (1 = *strongly disagree*, 5 = *strongly agree*)

- I am able to achieve a balance between my work in the program and life outside the program
- Students in the program are supportive of each other
- I have meaningful relationships with program faculty
- The faculty in my program care about me as a person
- Faculty are engaged in the program and its students
- Faculty in my program are motivated to provide the best environment for students' professional development
- I have been treated fairly by the faculty in my program
- I am proud to be a student in this program
- Faculty take graduate student ideas seriously
- Students are invested in the success of other students
- Faculty have reasonable expectations of students
- I am given timely and constructive feedback
- There is unhealthy competition within the program
- This program is accepting of people of various backgrounds and perspectives

Student Sample-Program Resources

My program offers me access to... (1 = *strongly disagree*, 5 = *strongly agree*)

- Career development services
- On-campus study spaces
- Dedicated spaces for graduate students
- Counseling services
- Statistical software
- Adequate library resources
- Mentoring
- Conferences
- Certifications and training (outside of classes)
- Funded assistantship
- Scholarships
- Funding for professional development activities (conferences, training, etc.)
- Program alumni

Student Survey-Satisfaction With the Program

Please indicate the extent to which you are satisfied with the following aspects of your program. (1 = *very dissatisfied*, 5 = *very satisfied*)

- Faculty support and accessibility
- Quality of instruction
- Balance between applied and academic emphases
- Quality of research in the program
- Connection with I-O, HR, and related communities
- Variety of course offerings
- Class size
- Culture of the program
- Availability of educational resources
- Internship and other professional opportunities
- Alumni engagement
- Engagement with the program during application process
- Student diversity
- Faculty diversity
- Student relationships
- Financial support
- Website and social media presence
- How well the program is preparing you for your career

Alumni Survey

Please indicate the extent to which you agree or disagree with the following statements. (1 = *strongly disagree*, 5 = *strongly agree*)

- I like to stay updated about current events in the program
- I like to participate in available alumni events/opportunities
- I would like to donate money to the program
- The program is keeping me updated about current events/developments
- I have been provided with the necessary skills to succeed in my current career
- I like to keep in touch with faculty
- I feel the program has prepared me well for my career
- I feel the program has helped me develop my soft skills (e.g. leadership, communication, public speaking)
- I would encourage others to apply to this program
- I am proud to be an alumnus of this program

APPENDIX B

Listing of All Programs Submitting at Least One Response

Albizu University
Angelo State University
Appalachian State University
California State University, San Bernardino
Clemson University
Cleveland State University
East Carolina University
Eastern Kentucky University
Elmhurst College
Emporia State University
Florida Institute of Technology
George Mason University
Illinois Institute of Technology
Indiana University-Purdue University at Indianapolis
Lamar University
Middle Tennessee State University
Minnesota State University-Mankato
Missouri State University
Montclair State University
Roosevelt University
Saint Cloud State University
San Diego State University
San Francisco State University
Southern Illinois University- Edwardsville
St. Mary's University
The University of Georgia
The University of New Haven
The University of Tennessee at Chattanooga
The University of Texas at Arlington
The University of Tulsa
Touro College
University at Albany, State University of New York
University of Baltimore
University of Central Florida
University of Hartford
University of Maryland
University of Maryland-Baltimore County
University of Minnesota-Duluth
University of Nebraska-Omaha
University of New Haven
University of West Florida
Valdosta State University
Western Kentucky University
Xavier University

The Interdisciplinarity of I-O Psychology PhD Programs and Faculty

Richard N. Landers, Michael B. Armstrong, Adrian B. Helms, and Alexis N. Epps
Old Dominion University

In this article, we propose a new criterion for use in evaluating and ranking graduate training programs in I-O psychology: their “interdisciplinarity,” which we conceptually define as the degree to which they contribute to and influence disciplines beyond I-O psychology, defined as publications in those disciplines and citations by those disciplines, respectively. We also present rankings of programs by their interdisciplinarity using various specific operationalizations and provide a listing of the secondary field of focus for all current individual I-O psychology PhD programs. If you want to skip the details, you can find an alternative way of looking at the summary rankings and tables below in the web app found at https://tntlab.shinyapps.io/io_programs/, which provides the same data reported here plus summaries of individual faculty member I-O and interdisciplinary publication productivity, with the ability to filter, sort, and search.

Why Study Program Interdisciplinarity?

A scientific discipline can be defined as a group of researchers (a) that agree upon central problems to be solved, (b) rely upon at least some agreed-upon facts relevant to solving those problems, and (c) produce explanations, goals, and theories to address those problems (Wagner et al, 2011). Interdisciplinary research integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines to advance knowledge or to solve problems whose solutions are beyond the scope of a single research discipline (National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, 2005). Thus, the “interdisciplinarity” of a graduate program in I-O psychology is the degree to which a given program emphasizes the importance of interdisciplinary research via publication in non-I-O outlets (i.e., interdisciplinary publication) and/or fosters citations within the research of non-I-O disciplines (i.e., interdisciplinary impact).

An interdisciplinary approach to education may not be the first feature that comes to mind when considering which graduate program to apply to or choose, but we contend that interdisciplinary education is important for a variety of reasons and worth consideration by graduate school applicants. Interdisciplinary education and research can benefit both students’ development of valuable KSAOs as well as the progress within a given scientific field such as I-O psychology.

With interdisciplinary education, students gain a comprehensive and holistic understanding of science and research (Spelt, Biemans, Tobi, Luning, & Mulder, 2009). With expanded and integrated knowledge structures, students can develop better critical thinking skills and creative problem solving (Jones, 2009; Spelt et al., 2009). They learn how to communicate across disciplines, building better networks of collaboration (Jones, 2009; Kleinberg, 2008). A broader skill set is developed that can be applied beyond a single given discipline, including lifelong learning, the ability to change perspectives, and the ability to cope with complex issues (Jones, 2009; Spelt et al., 2009).

Interdisciplinary research is becoming an integral feature of modern science (National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, 2005). The inherent complexity of nature, society, and technology necessitates a broader, comprehensive knowledge base to fully under-

stand the phenomena at play that can only be obtained through interdisciplinary work. Through interdisciplinary research, scientists can build from the work of other disciplines, reducing duplication of effort and streamlining the construction of new knowledge to address modern problems. For example, I-O psychology has recently begun to investigate the use of natural language processing to assess psychological constructs (Campion, Campion, Campion, & Reider, 2016). I-Os do not need to reinvent the wheel here: Linguists, cognitive scientists, and computer scientists have already been working on natural language processing techniques that can be applied to our areas of interest, correlating language categories with personality, emotions, and other psychological characteristics (Tausczik & Pennebaker, 2010), as well as automatically scoring written essays (Deane, 2013).

More practically, research funding organizations have recognized the shifts in nature, society, and technology that require interdisciplinary approaches to science, with many now giving special preference to interdisciplinary work that cannot be accomplished with expertise from a single discipline alone. Despite this shift and increasing recognition, I-O psychology and other domains have no convenient means of identifying the interdisciplinarity of a given academic or research-based program. The rankings presented here address this challenge.

How to Measure Interdisciplinarity

Interdisciplinarity as a research topic has been conceptualized broadly to include the integrations and interconnections of various research perspectives, concepts, and theories by individuals, facilities, or even countries (Porter, Cohen, Roessner, & Perreault, 2007). The practical question that remains is how to measure interdisciplinarity within these contexts in such a way that interdisciplinarity of entities can be meaningfully compared. This idea is studied within the field of bibliometrics (Wagner et al., 2011), defined as the study of the pattern or model of publications with the use of statistical analysis (Narin, 1976). Techniques such as citation analysis and evaluation of spatial distances have helped to broaden the perspective of interdisciplinarity by measuring aspects of scholarly productivity such as citation counts and the breadth of encompassed research areas.

Perhaps the simplest type of bibliometric research, citation analysis involves study of the relationships between a part or the whole of a cited document and a part or the whole of the citing document (Smith, 1981) to identify in what specific ways the authors of a work were influenced by others. It also considers the relationship between individual papers and the works the paper has cited (McBurney & Novak, 2002). In contrast, a study by Nichols (2014) created a latent topic model of text contained within National Science Foundation's award and proposal database to identify disciplinary influences, which revealed that disciplines that usually have less interdisciplinary interaction typically had less specialized language in their field; therefore, disciplines that have more interdisciplinarity are ones that have more general language. These approaches illustrate the varying perspectives taken to understand interdisciplinarity; as a result, there is no single best-in-class approach widely accepted in this research literature. However, citation analysis emerged for us as the most interpretable for those without expertise in bibliometrics and thus became the focus of our rankings.

Present Ranking Methodology

To rank programs in I-O psychology, we took a citation analysis approach which involved nine steps:

1. We by-hand created a list of all I-O psychology programs that currently offer PhDs as recorded in SIOP's online graduate program search tool. This includes any I-O program from around the world

that has signed up to be a part of the list, but due to SIOP's headquarters and primary membership, the list is primarily made up of US programs. This was initially a list of 73.

2. We by-hand searched the websites of each of those programs to determine (a) if they really were a traditional I-O program, and (b) who their faculty were. This was a bit of a subjective judgment, but ultimately, we included any program explicitly labeled "I-O psychology" and considered everything else to be an explicitly interdisciplinary or "I-O adjacent" program, resulting in a final list of 53 I-O programs, 14 adjacent, and 6 non-I-O. We considered adjacent programs to be less interesting for the rankings, because a graduate student applying to a program in (for example) "Applied Organizational Sciences" should already know that the program's going to be interdisciplinary. We still analyzed these programs, but they are not included in the tabular rankings. Additionally, if faculty were listed as having a primary home outside of the I-O psychology program (most common with affiliated management faculty), those faculty were not included. This was done in early spring 2017, so these placements are based on the database and website content at this point.
3. We by-hand linked each faculty member to their id numbers in Elsevier's Scopus database, which is a broad, cross-disciplinary database of journal publications and published conference proceedings from all academic fields. Some faculty had as many as three Scopus IDs due to variations in their names at time of publication and were combined by hand. Research has supported Scopus as having greater coverage than Web of Science and superior accuracy in comparison to Google Scholar, its primary competitors in bibliographic search (Falagas, Pitsouni, Malietzis & Pappas, 2007). It is generally regarded as one of the most comprehensive databases of scholarly publications currently available, including journals, books, book chapters, and conference proceedings, but due to the complexities of academic publishing, its accuracy should not be considered as absolute (Mongeon & Paul-Hus, 2016).
4. Using API scraping techniques (Landers, Brusso, Cavanaugh & Collmus, 2016) and an institutional membership to the Scopus database, we algorithmically, using R and the *rsopus* library, downloaded a list of every publication by every faculty member in our list from Scopus. We also downloaded Scopus' categorization of each journal these publications appeared in by discipline. This resulted in a list of 15,554 publications, although publications were listed once per faculty not per publication. Although this introduced nonindependence into the dataset, as 2087 publications (13.4%) have more than one I-O faculty author, we preferred this to alternative strategies, such as considering only first-authored publications or developing some sort of "contribution" index. Because authors on interdisciplinary publications are frequently not first in author order, we feared this would cut down our list of interdisciplinary publications dramatically and artificially.
5. We algorithmically downloaded a list of every article citing any one of those articles, also collecting Scopus' disciplinary categorization for these citations. This dataset was harvested in fall 2017 and resulted in a list of 577,120 citations, with the same caveat as described above.
6. Using these data, filtered to only include journal articles and to exclude errata, we created a list of unique publications by I-O PhD faculty in reverse order of popularity, which appears in 1. We also created something that looks vaguely like a scree plot using these data, which appears in Figure 1. Using this plot and table, we had hoped to identify a meaningful break for contrasting "core I-O" with "interdisciplinary" but were unable to find a clear division point except when comparing *Journal of Applied Psychology* with everything else. At the suggestion of two reviewers, we consulted the websites of each of the top 40 to determine the training of the editor-in-chief and, in cases of ambiguity, the associate editors. In other words, we looked to see if I-Os made editorial decisions for each of these journals. Decisions based upon this standard were clear in all cases except for the *Journal of Vocational Behavior (JVB)*, which also appears ranked 4th in Table 1. At the time of our check, the editor-in-chief of this journal held a degree in Counseling Psychology, and only 4 of the 8 associate editors held degrees in I-O, with one of these editors currently holding a position in a

Table 1
Frequency Table of I-O Journal Publication Representation

Publication Name	Count	Percent
<i>Journal of Applied Psychology</i>	722	9.93
<i>Journal of Business and Psychology</i>	209	2.88
<i>Journal of Organizational Behavior</i>	197	2.71
Journal of Vocational Behavior	195	2.68
<i>Human Performance</i>	174	2.39
<i>Industrial and Organizational Psychology</i>	158	2.17
<i>Journal of Occupational Health Psychology</i>	153	2.11
<i>International Journal of Selection and Assessment</i>	150	2.06
Journal of Applied Social Psychology	144	1.98
<i>Leadership Quarterly</i>	141	1.94
<i>Personnel Psychology</i>	139	1.91
Personality and Individual Differences	132	1.82
<i>Organizational Behavior and Human Decision Processes</i>	128	1.76
Organizational Research Methods	113	1.55
<i>Journal of Management</i>	100	1.38
<i>Human Resource Management Review</i>	87	1.20
Journal of Personality and Social Psychology	84	1.16
<i>Journal of Occupational and Organizational Psychology</i>	81	1.11
Educational and Psychological Measurement	77	1.06
Human Factors	66	0.91
<i>Military Psychology</i>	63	0.87
Applied Psychological Measurement	60	0.83
Creativity Research Journal	59	0.81
Applied Psychology	55	0.76
Computers in Human Behavior	51	0.70
Psychological Bulletin	47	0.65
Sex Roles	46	0.63
Work and Stress	46	0.63
American Psychologist	42	0.58
Group and Organization Management	41	0.57
<i>Journal of Managerial Psychology</i>	40	0.55
Journal of Research in Personality	38	0.52
Journal of Social Psychology	36	0.50
Human Relations	35	0.48
Organizational Behavior and Human Performance	35	0.48
Small Group Research	35	0.48
International Journal of Stress Management	32	0.44
Journal of Personality	31	0.43
Psychological Reports	31	0.43
Group Dynamics	30	0.41
Journal of Career Assessment	30	0.41
Journal of Psychology: Interdisciplinary and Applied	30	0.41
Accident Analysis and Prevention	29	0.40
Human Resource Management	29	0.40
Journal of Business Ethics	29	0.40
Personality and Social Psychology Bulletin	29	0.40
Academy of Management Journal	28	0.39
Journal of Safety Research	28	0.39
Teaching of Psychology	28	0.39
Basic and Applied Social Psychology	27	0.37
European Journal of Personality	27	0.37
European Journal of Work and Organizational Psychology	26	0.36
Journal of Organizational Behavior Management	26	0.36
Journal of Personality Assessment	25	0.34
Psychology of Aesthetics, Creativity, and The Arts	25	0.34
Stress and Health	25	0.34
Ethics and Behavior	24	0.33
Journal of Cross-Cultural Psychology	24	0.33
Journal of Experimental Social Psychology	24	0.33
Psychological Assessment	22	0.30
Bulletin of The Psychonomic Society	21	0.29

Publication Name	Count	Percent
Career Development Quarterly	21	0.29
Journal of Nonverbal Behavior	20	0.28
Journal of Creative Behavior	19	0.26
Journal of Educational Psychology	19	0.26
Psychological Methods	19	0.26
Canadian Journal of Behavioural Science	18	0.25
Journal of Counseling Psychology	18	0.25
Multivariate Behavioral Research	18	0.25
Psychological Science	18	0.25
Consulting Psychology Journal	17	0.23
Frontiers in Psychology	17	0.23
International Journal of Aviation Psychology	17	0.23
Journal of Career Development	17	0.23
Psychology of Women Quarterly	17	0.23
Canadian Psychology	16	0.22
Current Directions in Psychological Science	16	0.22
Journal of Applied Behavior Analysis	16	0.22
Journal of Behavioral Decision Making	16	0.22
Journal of Leadership and Organizational Studies	16	0.22
Motivation and Emotion	16	0.22
Psychology and Aging	16	0.22
Science and Engineering Ethics	16	0.22
Accountability in Research	15	0.21
Applied Ergonomics	14	0.19
Employee Responsibilities and Rights Journal	14	0.19
Environment and Behavior	14	0.19
Journal of Applied Behavioral Science	14	0.19
Journal of Experimental Psychology	14	0.19
Journal of Occupational and Environmental Medicine	14	0.19
Journal of Occupational Psychology	14	0.19
Journal of Psychology	14	0.19
Public Personnel Management	14	0.19
Cultural Diversity and Ethnic Minority Psychology	13	0.18
Journal of Personnel Psychology	13	0.18
Asian American Journal of Psychology	12	0.17
Intelligence	12	0.17
Joint Commission Journal On Quality and Patient Safety	12	0.17
Journal of Prevention and Intervention In The Community	12	0.17
Journal of Traumatic Stress	12	0.17
Behavior Research Methods	11	0.15
Current Psychology	11	0.15
Educational Measurement: Issues and Practice	11	0.15
Journal of Experimental Psychology: Applied	11	0.15
Learning and Individual Differences	11	0.15
Plos One	11	0.15
Psychologist-Manager Journal	11	0.15
Academy of Management Learning and Education	10	0.14
American Journal of Community Psychology	10	0.14
Assessment	10	0.14
Ergonomics	10	0.14
Human Resource Development Quarterly	10	0.14
International Journal of Human Resource Management	10	0.14
Journal of General Psychology	10	0.14
Journal of Social Behavior and Personality	10	0.14
Perceptual and Motor Skills	10	0.14
Psychosomatic Medicine	10	0.14
Safety Science	10	0.14
Social Behavior and Personality	10	0.14
Social Justice Research	10	0.14

Note. Italicized journal names indicate “core I-O” journals.

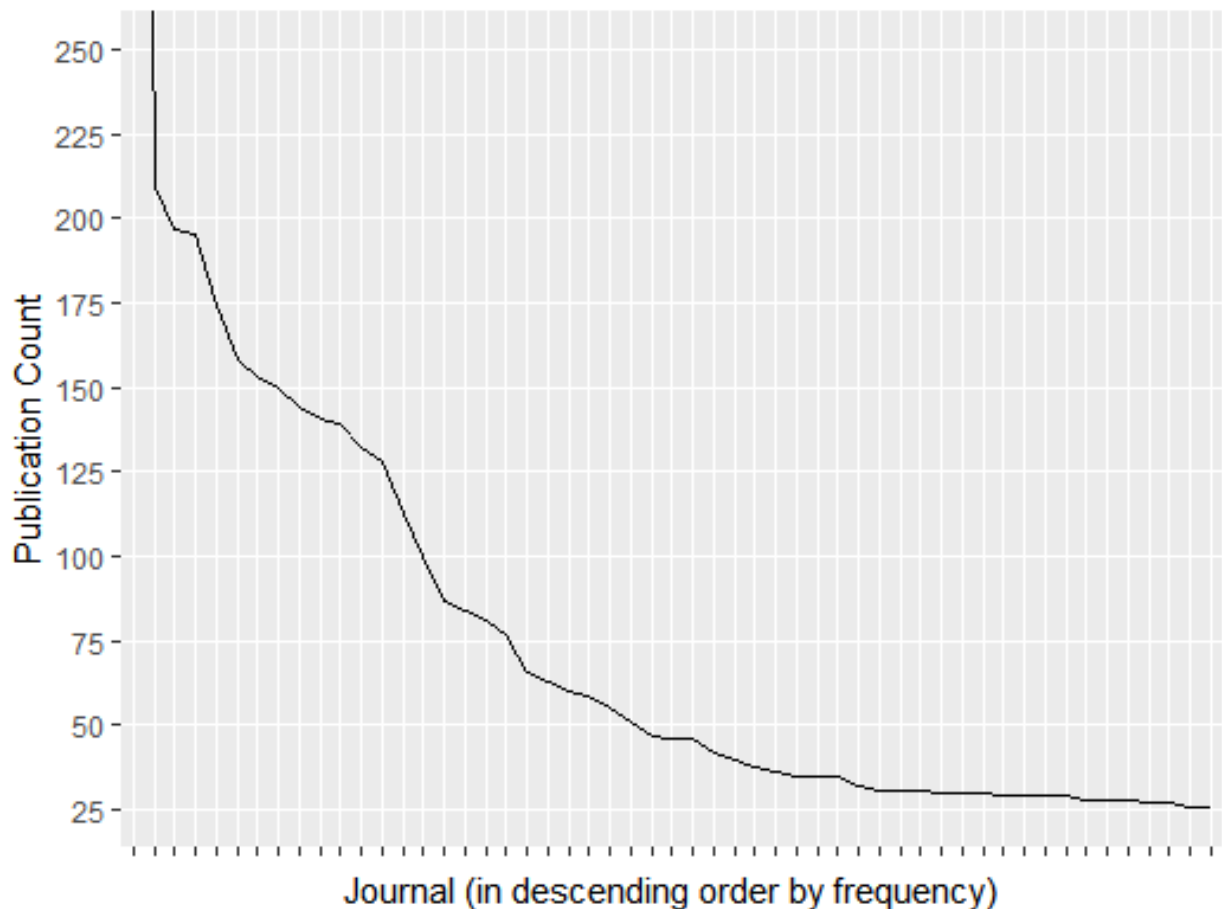


Figure 1.

business school. Given (a) *JVB*'s associate editor training and employment lean and (b) its current mission statement (i.e., from [its webpage](#): "publishes original empirical and theoretical articles that contribute novel insights to the fields of career choice, career development, and work adjustment across the lifespan and which are also valuable for applications in counseling and career development programs"), we made the decision to classify *JVB*, at least in its current form, as "interdisciplinary." Journals classified as core I-O using this system appear in italics in Table 1.

7. Using this categorization, we algorithmically labeled each publication and citation as either interdisciplinary or not and then tabulated these counts in several distinct ways, and these tables appear in **Tables 2-8**. If a publication had multiple I-O authors, it was counted once per author in these lists, and authorship order was ignored. Programs we previously categorized as "I-O adjacent" appear in **Table 9**.
8. Next, we restructured the data to represent counts across disciplines within program and reverse-ordered them by count, excluding the categories "Applied Psychology" and "Psychology (all)," because these appeared as first and second for almost every program in our list. These results appear in **Table 10**, summarizing the most common interdisciplinary fields published in by each program.
9. Finally, we created an online app that summarizes all this information, which is available at https://tntlab.shinyapps.io/io_programs/

A correlation matrix of all study variables, which appears in **Table 11**. We can summarize the ranking tables thus:

Table 2

Full Program Listing with All Variables

Program Name	State	Num. Faculty	Total Pubs	Interdisciplinary Pubs	IO Pubs	Interdisciplinary Pubs per Total Pub	Total Pubs per Faculty	Interdisciplinary Pubs per Faculty	IO Pubs per Faculty	Total Citations	Interdisciplinary Citations	IO Citations	Interdisciplinary Citations per Citation	Total Citations per Faculty	Interdisciplinary Citations per Faculty	IO Citations per Faculty
Alliant International University, Los Angeles	CA	4	27	21	6	0.78	6.75	5.25	1.50	554	509	45	0.92	138.50	127.25	11.25
Alliant International University, San Diego	CA	5	102	96	6	0.94	20.40	19.20	1.20	2093	2033	60	0.97	418.60	406.60	12.00
Auburn University	AL	6	149	122	27	0.82	24.83	20.33	4.50	3154	2768	386	0.88	525.67	461.33	64.33
Baruch College, City University of New York	NY	6	86	46	40	0.53	14.33	7.67	6.67	5002	4109	893	0.82	833.67	684.83	148.83
Bowling Green State University	OH	5	224	120	104	0.54	44.80	24.00	20.80	7975	6243	1732	0.78	1595.00	1248.60	346.40
Central Michigan University	MI	5	184	114	70	0.62	36.80	22.80	14.00	8346	6934	1412	0.83	1669.20	1386.80	282.40
Clemson University	SC	11	397	314	83	0.79	36.09	28.55	7.55	14251	13022	1229	0.91	1295.55	1183.82	111.73
Colorado State University	CO	6	214	92	122	0.43	35.67	15.33	20.33	9947	7800	2147	0.78	1657.83	1300.00	357.83
DePaul University	IL	5	84	51	33	0.61	16.80	10.20	6.60	3817	3363	454	0.88	763.40	672.60	90.80
Florida Institute of Technology	FL	8	97	57	40	0.59	12.13	7.13	5.00	1936	1621	315	0.84	242.00	202.63	39.38
Florida International University	FL	3	109	60	49	0.55	36.33	20.00	16.33	7548	5647	1901	0.75	2516.00	1882.33	633.67
George Mason University	VA	7	302	170	132	0.56	43.14	24.29	18.86	16558	13517	3041	0.82	2365.43	1931.00	434.43
George Washington University	DC	3	69	49	20	0.71	23.00	16.33	6.67	2075	1682	393	0.81	691.67	560.67	131.00
Georgia Institute of Technology	GA	4	131	70	61	0.53	32.75	17.50	15.25	8568	6791	1777	0.79	2142.00	1697.75	444.25
Griffith University	MG	5	270	252	18	0.93	54.00	50.40	3.60	5933	5668	265	0.96	1186.60	1133.60	53.00
Hofstra University	NY	4	36	22	14	0.61	9.00	5.50	3.50	478	431	47	0.90	119.50	107.75	11.75
Illinois Institute of Technology	IL	4	98	62	36	0.63	24.50	15.50	9.00	3603	3219	384	0.89	900.75	804.75	96.00
Kansas State University	KS	2	41	25	16	0.61	20.50	12.50	8.00	1200	1013	187	0.84	600.00	506.50	93.50
Louisiana State University	LA	2	5	3	2	0.60	2.50	1.50	1.00	11	10	1	0.91	5.50	5.00	0.50
Louisiana Tech University	LA	3	7	6	1	0.86	2.33	2.00	0.33	141	118	23	0.84	47.00	39.33	7.67
Michigan State University	MI	9	512	281	231	0.55	56.89	31.22	25.67	24536	19539	4997	0.80	2726.22	2171.00	555.22
North Carolina State University	NC	5	100	63	37	0.63	20.00	12.60	7.40	2880	2514	366	0.87	576.00	502.80	73.20
Ohio University	OH	1	41	17	24	0.41	41.00	17.00	24.00	2718	2210	508	0.81	2718.00	2210.00	508.00
Old Dominion University	VA	4	94	60	34	0.64	23.50	15.00	8.50	2180	1810	370	0.83	545.00	452.50	92.50
Pennsylvania State University	PA	6	203	105	98	0.52	33.83	17.50	16.33	12634	10133	2501	0.80	2105.67	1688.83	416.83
Portland State University	OR	5	172	83	89	0.48	34.40	16.60	17.80	5936	4498	1438	0.76	1187.20	899.60	287.60
Purdue University	IN	5	153	107	46	0.70	30.60	21.40	9.20	6403	5474	929	0.85	1280.60	1094.80	185.80
Rice University	TX	5	502	349	153	0.70	100.40	69.80	30.60	29131	25322	3809	0.87	5826.20	5064.40	761.80
Roosevelt University	IL	4	43	38	5	0.88	10.75	9.50	1.25	536	520	16	0.97	134.00	130.00	4.00
Saint Louis University	MO	4	49	36	13	0.73	12.25	9.00	3.25	1715	1602	113	0.93	428.75	400.50	28.25
Saint Mary's University	MN	7	220	161	59	0.73	31.43	23.00	8.43	9034	7853	1181	0.87	1290.57	1121.86	168.71
Seattle Pacific University	WA	4	27	23	4	0.85	6.75	5.75	1.00	502	414	88	0.82	125.50	103.50	22.00
Texas A&M University	TX	5	166	83	83	0.50	33.20	16.60	16.60	6412	5117	1295	0.80	1282.40	1023.40	259.00
University at Albany, SUNY	NY	5	78	38	40	0.49	15.60	7.60	8.00	1624	1358	266	0.84	324.80	271.60	53.20
University of Akron	OH	4	162	84	78	0.52	40.50	21.00	19.50	5734	4509	1225	0.79	1433.50	1127.25	306.25
University of Calgary	AB	6	224	189	35	0.84	37.33	31.50	5.83	8199	7333	866	0.89	1366.50	1222.17	144.33
University of Central Florida	FL	6	76	53	23	0.70	12.67	8.83	3.83	1284	1168	116	0.91	214.00	194.67	19.33
University of Connecticut	CT	4	141	97	44	0.69	35.25	24.25	11.00	4301	3532	769	0.82	1075.25	883.00	192.25
University of Georgia	GA	10	419	325	94	0.78	41.90	32.50	9.40	21253	19401	1852	0.91	2125.30	1940.10	185.20
University of Guelph	ON	7	78	50	28	0.64	11.14	7.14	4.00	4066	3550	516	0.87	580.86	507.14	73.71
University of Houston	TX	6	202	121	81	0.60	33.67	20.17	13.50	17691	15015	2676	0.85	2948.50	2502.50	446.00
University of Illinois at Urbana-Champaign	IL	3	232	121	111	0.52	77.33	40.33	37.00	13453	10903	2550	0.81	4484.33	3634.33	850.00
University of Minnesota	MN	5	304	116	188	0.38	60.80	23.20	37.60	17070	12295	4775	0.72	3414.00	2459.00	955.00
University of Missouri-St Louis	MO	7	169	135	34	0.80	24.14	19.29	4.86	3651	3269	382	0.90	521.57	467.00	54.57
University of Nebraska at Omaha	NE	5	145	129	16	0.89	29.00	25.80	3.20	3324	3123	201	0.94	664.80	624.60	40.20
University of Oklahoma	OK	4	380	270	110	0.71	95.00	67.50	27.50	12730	10260	2470	0.81	3182.50	2565.00	617.50
University of South Florida	FL	8	488	295	193	0.60	61.00	36.88	24.13	33899	27849	6050	0.82	4237.38	3481.13	756.25
University of Texas at Arlington	TX	3	95	87	8	0.92	31.67	29.00	2.67	3444	3312	132	0.96	1148.00	1104.00	44.00
University of Tulsa	OK	5	65	39	26	0.60	13.00	7.80	5.20	1788	1286	502	0.72	357.60	257.20	100.40
University of Waterloo	ON	6	146	88	58	0.60	24.33	14.67	9.67	6049	4965	1084	0.82	1008.17	827.50	180.67
University of Western Ontario	ON	4	185	117	68	0.63	46.25	29.25	17.00	29577	26025	3552	0.88	7394.25	6506.25	888.00
Virginia Tech	VA	3	215	184	31	0.86	71.67	61.33	10.33	4795	4172	623	0.87	1598.33	1390.67	207.67
Wayne State University	MI	5	102	62	40	0.61	20.40	12.40	8.00	4753	4103	650	0.86	950.60	820.60	130.00

Table 3

Programs Ranked by Raw Interdisciplinary Publication Counts

Rank	Program Name	IO Pubs	Interdisciplinary Pubs	Interdisciplinary Pubs per Faculty
1	Rice University	153	349	69.80
2	University of Georgia	94	325	32.50
3	Clemson University	83	314	28.55
4	University of South Florida	193	295	36.88
5	Michigan State University	231	281	31.22
6	University of Oklahoma	110	270	67.50
7	Griffith University	18	252	50.40
8	University of Calgary	35	189	31.50
9	Virginia Tech	31	184	61.33
10	George Mason University	132	170	24.29
11	Saint Mary's University	59	161	23.00
12	University of Missouri-St Louis	34	135	19.29
13	University of Nebraska at Omaha	16	129	25.80
14	Auburn University	27	122	20.33
15	University of Houston	81	121	20.17
15	University of Illinois at Urbana-Champaign	111	121	40.33
17	Bowling Green State University	104	120	24.00
18	University of Western Ontario	68	117	29.25
19	University of Minnesota	188	116	23.20
20	Central Michigan University	70	114	22.80
21	Purdue University	46	107	21.40
22	Pennsylvania State University	98	105	17.50
23	University of Connecticut	44	97	24.25
24	Alliant International University, San Diego	6	96	19.20
25	Colorado State University	122	92	15.33
26	University of Waterloo	58	88	14.67
27	University of Texas at Arlington	8	87	29.00
28	University of Akron	78	84	21.00
29	Portland State University	89	83	16.60
29	Texas A&M University	83	83	16.60
31	Georgia Institute of Technology	61	70	17.50
32	North Carolina State University	37	63	12.60
33	Illinois Institute of Technology	36	62	15.50
33	Wayne State University	40	62	12.40
35	Florida International University	49	60	20.00
35	Old Dominion University	34	60	15.00
37	Florida Institute of Technology	40	57	7.13
38	University of Central Florida	23	53	8.83
39	DePaul University	33	51	10.20
40	University of Guelph	28	50	7.14
41	George Washington University	20	49	16.33
42	Baruch College, City University of New York	40	46	7.67
43	University of Tulsa	26	39	7.80
44	Roosevelt University	5	38	9.50
44	University at Albany, SUNY	40	38	7.60
46	Saint Louis University	13	36	9.00
47	Kansas State University	16	25	12.50
48	Seattle Pacific University	4	23	5.75
49	Hofstra University	14	22	5.50
50	Alliant International University, Los Angeles	6	21	5.25
51	Ohio University	24	17	17.00
52	Louisiana Tech University	1	6	2.00
53	Louisiana State University	2	3	1.50

Table 4

Programs Ranked by Proportion of Interdisciplinary Publications per Publication

Rank	Program Name	IO Pubs	Interdisciplinary Pubs	Interdisciplinary Pubs per Total Pub	Interdisciplinary Pubs per Faculty
1	Alliant International University, San Diego	6	96	0.94	19.20
2	Griffith University	18	252	0.93	50.40
3	University of Texas at Arlington	8	87	0.92	29.00
4	University of Nebraska at Omaha	16	129	0.89	25.80
5	Roosevelt University	5	38	0.88	9.50
6	Louisiana Tech University	1	6	0.86	2.00
7	Virginia Tech	31	184	0.86	61.33
8	Seattle Pacific University	4	23	0.85	5.75
9	University of Calgary	35	189	0.84	31.50
10	Auburn University	27	122	0.82	20.33
11	University of Missouri-St Louis	34	135	0.80	19.29
12	Clemson University	83	314	0.79	28.55
13	Alliant International University, Los Angeles	6	21	0.78	5.25
14	University of Georgia	94	325	0.78	32.50
15	Saint Louis University	13	36	0.73	9.00
16	Saint Mary's University	59	161	0.73	23.00
17	University of Oklahoma	110	270	0.71	67.50
18	George Washington University	20	49	0.71	16.33
19	Purdue University	46	107	0.70	21.40
20	University of Central Florida	23	53	0.70	8.83
21	Rice University	153	349	0.70	69.80
22	University of Connecticut	44	97	0.69	24.25
23	University of Guelph	28	50	0.64	7.14
24	Old Dominion University	34	60	0.64	15.00
25	Illinois Institute of Technology	36	62	0.63	15.50
26	University of Western Ontario	68	117	0.63	29.25
27	North Carolina State University	37	63	0.63	12.60
28	Central Michigan University	70	114	0.62	22.80
29	Hofstra University	14	22	0.61	5.50
30	Kansas State University	16	25	0.61	12.50
31	Wayne State University	40	62	0.61	12.40
32	DePaul University	33	51	0.61	10.20
33	University of South Florida	193	295	0.60	36.88
34	University of Waterloo	58	88	0.60	14.67
35	Louisiana State University	2	3	0.60	1.50
35	University of Tulsa	26	39	0.60	7.80
37	University of Houston	81	121	0.60	20.17
38	Florida Institute of Technology	40	57	0.59	7.13
39	George Mason University	132	170	0.56	24.29
40	Florida International University	49	60	0.55	20.00
41	Michigan State University	231	281	0.55	31.22
42	Bowling Green State University	104	120	0.54	24.00
43	Baruch College, City University of New York	40	46	0.53	7.67
44	Georgia Institute of Technology	61	70	0.53	17.50
45	University of Illinois at Urbana-Champaign	111	121	0.52	40.33
46	University of Akron	78	84	0.52	21.00
47	Pennsylvania State University	98	105	0.52	17.50
48	Texas A&M University	83	83	0.50	16.60
49	University at Albany, SUNY	40	38	0.49	7.60
50	Portland State University	89	83	0.48	16.60
51	Colorado State University	122	92	0.43	15.33
52	Ohio University	24	17	0.41	17.00
53	University of Minnesota	188	116	0.38	23.20

Table 5

Programs Ranked by Raw IO Publication Counts

Rank	Program Name	IO Pubs	IO Pubs per Faculty
1	Michigan State University	231	25.67
2	University of South Florida	193	24.13
3	University of Minnesota	188	37.60
4	Rice University	153	30.60
5	George Mason University	132	18.86
6	Colorado State University	122	20.33
7	University of Illinois at Urbana-Champaign	111	37.00
8	University of Oklahoma	110	27.50
9	Bowling Green State University	104	20.80
10	Pennsylvania State University	98	16.33
11	University of Georgia	94	9.40
12	Portland State University	89	17.80
13	Clemson University	83	7.55
13	Texas A&M University	83	16.60
15	University of Houston	81	13.50
16	University of Akron	78	19.50
17	Central Michigan University	70	14.00
18	University of Western Ontario	68	17.00
19	Georgia Institute of Technology	61	15.25
20	Saint Mary's University	59	8.43
21	University of Waterloo	58	9.67
22	Florida International University	49	16.33
23	Purdue University	46	9.20
24	University of Connecticut	44	11.00
25	Baruch College, City University of New York	40	6.67
25	Florida Institute of Technology	40	5.00
25	University at Albany, SUNY	40	8.00
25	Wayne State University	40	8.00
29	North Carolina State University	37	7.40
30	Illinois Institute of Technology	36	9.00
31	University of Calgary	35	5.83
32	Old Dominion University	34	8.50
32	University of Missouri-St Louis	34	4.86
34	DePaul University	33	6.60
35	Virginia Tech	31	10.33
36	University of Guelph	28	4.00
37	Auburn University	27	4.50
38	University of Tulsa	26	5.20
39	Ohio University	24	24.00
40	University of Central Florida	23	3.83
41	George Washington University	20	6.67
42	Griffith University	18	3.60
43	Kansas State University	16	8.00
43	University of Nebraska at Omaha	16	3.20
45	Hofstra University	14	3.50
46	Saint Louis University	13	3.25
47	University of Texas at Arlington	8	2.67
48	Alliant International University, Los Angeles	6	1.50
48	Alliant International University, San Diego	6	1.20
50	Roosevelt University	5	1.25
51	Seattle Pacific University	4	1.00
52	Louisiana State University	2	1.00
53	Louisiana Tech University	1	0.33

Table 6

Programs Ranked by Raw Interdisciplinary Citation Count

Rank	Program Name	IO Citations	Interdisciplinary Citations	Interdisciplinary Citations per Faculty
1	University of South Florida	6050	27849	3481.13
2	University of Western Ontario	3552	26025	6506.25
3	Rice University	3809	25322	5064.40
4	Michigan State University	4997	19539	2171.00
5	University of Georgia	1852	19401	1940.10
6	University of Houston	2676	15015	2502.50
7	George Mason University	3041	13517	1931.00
8	Clemson University	1229	13022	1183.82
9	University of Minnesota	4775	12295	2459.00
10	University of Illinois at Urbana-Champaign	2550	10903	3634.33
11	University of Oklahoma	2470	10260	2565.00
12	Pennsylvania State University	2501	10133	1688.83
13	Saint Mary's University	1181	7853	1121.86
14	Colorado State University	2147	7800	1300.00
15	University of Calgary	866	7333	1222.17
16	Central Michigan University	1412	6934	1386.80
17	Georgia Institute of Technology	1777	6791	1697.75
18	Bowling Green State University	1732	6243	1248.60
19	Griffith University	265	5668	1133.60
20	Florida International University	1901	5647	1882.33
21	Purdue University	929	5474	1094.80
22	Texas A&M University	1295	5117	1023.40
23	University of Waterloo	1084	4965	827.50
24	University of Akron	1225	4509	1127.25
25	Portland State University	1438	4498	899.60
26	Virginia Tech	623	4172	1390.67
27	Baruch College, City University of New York	893	4109	684.83
28	Wayne State University	650	4103	820.60
29	University of Guelph	516	3550	507.14
30	University of Connecticut	769	3532	883.00
31	DePaul University	454	3363	672.60
32	University of Texas at Arlington	132	3312	1104.00
33	University of Missouri-St Louis	382	3269	467.00
34	Illinois Institute of Technology	384	3219	804.75
35	University of Nebraska at Omaha	201	3123	624.60
36	Auburn University	386	2768	461.33
37	North Carolina State University	366	2514	502.80
38	Ohio University	508	2210	2210.00
39	Alliant International University, San Diego	60	2033	406.60
40	Old Dominion University	370	1810	452.50
41	George Washington University	393	1682	560.67
42	Florida Institute of Technology	315	1621	202.63
43	Saint Louis University	113	1602	400.50
44	University at Albany, SUNY	266	1358	271.60
45	University of Tulsa	502	1286	257.20
46	University of Central Florida	116	1168	194.67
47	Kansas State University	187	1013	506.50
48	Roosevelt University	16	520	130.00
49	Alliant International University, Los Angeles	45	509	127.25
50	Hofstra University	47	431	107.75
51	Seattle Pacific University	88	414	103.50
52	Louisiana Tech University	23	118	39.33
53	Louisiana State University	1	10	5.00

Table 7

Programs Ranked by Proportion of Interdisciplinary Citations per Citation (Interdisciplinary Impact Rate)

Rank	Program Name	IO Citations	Interdisciplinary Citations	Interdisciplinary Citations per Citation	Interdisciplinary Citations per Faculty
1	Alliant International University, San Diego	60	2033	0.97	406.60
2	Roosevelt University	16	520	0.97	130.00
3	University of Texas at Arlington	132	3312	0.96	1104.00
4	Griffith University	265	5668	0.96	1133.60
5	University of Nebraska at Omaha	201	3123	0.94	624.60
6	Saint Louis University	113	1602	0.93	400.50
7	Alliant International University, Los Angeles	45	509	0.92	127.25
8	Clemson University	1229	13022	0.91	1183.82
9	University of Georgia	1852	19401	0.91	1940.10
10	University of Central Florida	116	1168	0.91	194.67
11	Louisiana State University	1	10	0.91	5.00
12	Hofstra University	47	431	0.90	107.75
13	University of Missouri-St Louis	382	3269	0.90	467.00
14	University of Calgary	866	7333	0.89	1222.17
15	Illinois Institute of Technology	384	3219	0.89	804.75
16	DePaul University	454	3363	0.88	672.60
17	University of Western Ontario	3552	26025	0.88	6506.25
18	Auburn University	386	2768	0.88	461.33
19	University of Guelph	516	3550	0.87	507.14
20	North Carolina State University	366	2514	0.87	502.80
21	Virginia Tech	623	4172	0.87	1390.67
22	Saint Mary's University	1181	7853	0.87	1121.86
23	Rice University	3809	25322	0.87	5064.40
24	Wayne State University	650	4103	0.86	820.60
25	Purdue University	929	5474	0.85	1094.80
26	University of Houston	2676	15015	0.85	2502.50
27	Kansas State University	187	1013	0.84	506.50
28	Florida Institute of Technology	315	1621	0.84	202.63
29	Louisiana Tech University	23	118	0.84	39.33
30	University at Albany, SUNY	266	1358	0.84	271.60
31	Central Michigan University	1412	6934	0.83	1386.80
32	Old Dominion University	370	1810	0.83	452.50
33	Seattle Pacific University	88	414	0.82	103.50
34	University of South Florida	6050	27849	0.82	3481.13
35	Baruch College, City University of New York	893	4109	0.82	684.83
36	University of Connecticut	769	3532	0.82	883.00
37	University of Waterloo	1084	4965	0.82	827.50
38	George Mason University	3041	13517	0.82	1931.00
39	Ohio University	508	2210	0.81	2210.00
40	George Washington University	393	1682	0.81	560.67
41	University of Illinois at Urbana-Champaign	2550	10903	0.81	3634.33
42	University of Oklahoma	2470	10260	0.81	2565.00
43	Pennsylvania State University	2501	10133	0.80	1688.83
44	Texas A&M University	1295	5117	0.80	1023.40
45	Michigan State University	4997	19539	0.80	2171.00
46	Georgia Institute of Technology	1777	6791	0.79	1697.75
47	University of Akron	1225	4509	0.79	1127.25
48	Colorado State University	2147	7800	0.78	1300.00
49	Bowling Green State University	1732	6243	0.78	1248.60
50	Portland State University	1438	4498	0.76	899.60
51	Florida International University	1901	5647	0.75	1882.33
52	University of Minnesota	4775	12295	0.72	2459.00
53	University of Tulsa	502	1286	0.72	257.20

Table 8

Programs Ranked by Raw I-O Citation Count

Rank	Program Name	IO Citations	Interdisciplinary Citations	Interdisciplinary Citations per Faculty
1	University of South Florida	6050	27849	3481.13
2	Michigan State University	4997	19539	2171.00
3	University of Minnesota	4775	12295	2459.00
4	Rice University	3809	25322	5064.40
5	University of Western Ontario	3552	26025	6506.25
6	George Mason University	3041	13517	1931.00
7	University of Houston	2676	15015	2502.50
8	University of Illinois at Urbana-Champaign	2550	10903	3634.33
9	Pennsylvania State University	2501	10133	1688.83
10	University of Oklahoma	2470	10260	2565.00
11	Colorado State University	2147	7800	1300.00
12	Florida International University	1901	5647	1882.33
13	University of Georgia	1852	19401	1940.10
14	Georgia Institute of Technology	1777	6791	1697.75
15	Bowling Green State University	1732	6243	1248.60
16	Portland State University	1438	4498	899.60
17	Central Michigan University	1412	6934	1386.80
18	Texas A&M University	1295	5117	1023.40
19	Clemson University	1229	13022	1183.82
20	University of Akron	1225	4509	1127.25
21	Saint Mary's University	1181	7853	1121.86
22	University of Waterloo	1084	4965	827.50
23	Purdue University	929	5474	1094.80
24	Baruch College, City University of New York	893	4109	684.83
25	University of Calgary	866	7333	1222.17
26	University of Connecticut	769	3532	883.00
27	Wayne State University	650	4103	820.60
28	Virginia Tech	623	4172	1390.67
29	University of Guelph	516	3550	507.14
30	Ohio University	508	2210	2210.00
31	University of Tulsa	502	1286	257.20
32	DePaul University	454	3363	672.60
33	George Washington University	393	1682	560.67
34	Auburn University	386	2768	461.33
35	Illinois Institute of Technology	384	3219	804.75
36	University of Missouri-St Louis	382	3269	467.00
37	Old Dominion University	370	1810	452.50
38	North Carolina State University	366	2514	502.80
39	Florida Institute of Technology	315	1621	202.63
40	University at Albany, SUNY	266	1358	271.60
41	Griffith University	265	5668	1133.60
42	University of Nebraska at Omaha	201	3123	624.60
43	Kansas State University	187	1013	506.50
44	University of Texas at Arlington	132	3312	1104.00
45	University of Central Florida	116	1168	194.67
46	Saint Louis University	113	1602	400.50
47	Seattle Pacific University	88	414	103.50
48	Alliant International University, San Diego	60	2033	406.60
49	Hofstra University	47	431	107.75
50	Alliant International University, Los Angeles	45	509	127.25
51	Louisiana Tech University	23	118	39.33
52	Roosevelt University	16	520	130.00
53	Louisiana State University	1	10	5.00

Table 9

Full Listing of Explicitly Interdisciplinary and Non-Traditional SIOP I-O Programs with All Variables

Program Name	State	Program Type	Num. Faculty	Total Pubs	Inter. Pubs	IO Pubs	Interdisciplinary Pubs per Total Pub	Total Pubs per Faculty	Interdisciplinary Pubs per Faculty	IO Pubs per Faculty	Total Citations	Interdisciplinary Citations	IO Citation	Interdisciplinary Citations per Cite	Total Citations per Faculty	Interdisciplinary Citation per Faculty	IO Citation per Faculty
Alliant Int'l University, San Francisco	CA	Org Development	3	15	15	0	1.00	5.00	5.00	0.00	121	118	3	0.98	40.33	39.33	1.00
Claremont Graduate University	CA	Organizational Behavior/Org Psychology	7	362	343	19	0.95	51.71	49.00	2.71	27172	26109	1063	0.96	3881.71	3729.86	151.86
East Carolina University	NC	Health Psychology	5	76	70	6	0.92	15.20	14.00	1.20	1014	922	92	0.91	202.80	184.40	18.40
Indiana University - Purdue University Indianapolis	IN	Social/Org Psychology	4	87	74	13	0.85	21.75	18.50	3.25	2425	2154	271	0.89	606.25	538.50	67.75
Northern Illinois University	IL	Social/I-O Psychology	6	281	250	31	0.89	46.83	41.67	5.17	7237	6883	354	0.95	1206.17	1147.17	59.00
Singapore Management University (SMU)	Singapore	General Psychology	6	113	86	27	0.76	18.83	14.33	4.50	5462	4274	1188	0.78	910.33	712.33	198.00
Southern Illinois University Carbondale	IL	General Psychology	1	22	22	0	1.00	22.00	22.00	0.00	622	614	8	0.99	622.00	614.00	8.00
Teachers College, Columbia University	NY	Social/Org Psychology	10	216	183	33	0.85	21.60	18.30	3.30	6031	5360	671	0.89	603.10	536.00	67.10
Temple University	PA	Social/Org Psychology	2	80	77	3	0.96	40.00	38.50	1.50	2564	2528	36	0.99	1282.00	1264.00	18.00
University of Cincinnati	OH	Experimental Psychology	4	39	29	10	0.74	9.75	7.25	2.50	1041	925	116	0.89	260.25	231.25	29.00
University of Maryland	MD	Social/I-O Psychology	7	461	400	61	0.87	65.86	57.14	8.71	25627	24013	1614	0.94	3661.00	3430.43	230.57
University of North Carolina Charlotte	NC	Organizational Sciences	9	226	154	72	0.68	25.11	17.11	8.00	8133	7348	785	0.90	903.67	816.44	87.22
Washington State University	WA	Experimental Psychology	1	63	45	18	0.71	63.00	45.00	18.00	1876	1616	260	0.86	1876.00	1616.00	260.00
Western Michigan University	MI	Behavior Management/I-O Psychology	5	170	170	0	1.00	34.00	34.00	0.00	2173	2149	24	0.99	434.60	429.80	4.80

Table 10

Top Five Publication Disciplines per Program Excluding "Psychology (all)" and "Applied Psychology"

Program Name	1st	2nd	3rd	4th	5th
Alliant Int'l University, San Francisco	Organizational Behavior and Human Resource Management	Social Sciences (all)	Business, Management and Accounting (all)	Philosophy	Education
Alliant International University, Los Angeles	Social Psychology	Communication	Psychology (miscellaneous)	Sociology and Political Science	Management of Technology and Innovation
Alliant International University, San Diego	Nursing (all)	Psychology (miscellaneous)	Cardiology and Cardiovascular Medicine	Medicine (all)	Developmental and Educational Psychology
Auburn University	Public Health, Environmental and Occupational Health	Clinical Psychology	Experimental and Cognitive Psychology	Psychiatry and Mental Health	Business and International Management
Baruch College, City University of New York	Social Psychology	Business and International Management	Education	Organizational Behavior and Human Resource Management	Decision Sciences (all)
Bowling Green State University	Social Psychology	Organizational Behavior and Human Resource Management	Business and International Management	Education	Decision Sciences (all)
Central Michigan University	Arts and Humanities (miscellaneous)	Medicine (all)	Organizational Behavior and Human Resource Management	Education	Social Psychology
Claremont Graduate University	Social Psychology	Business and International Management	Sociology and Political Science	Communication	Economics and Econometrics
Clemson University	Social Psychology	Psychiatry and Mental Health	Public Health, Environmental and Occupational Health	Clinical Psychology	Physiology
Colorado State University	Organizational Behavior and Human Resource Management	Business and International Management	Business, Management and Accounting (all)	Education	Social Psychology
DePaul University	Social Psychology	Business and International Management	Decision Sciences (all)	Gender Studies	Management of Technology and Innovation
East Carolina University	Education	Social Psychology	Clinical Psychology	Developmental and Educational Psychology	Psychiatry and Mental Health
Florida Institute of Technology	Social Psychology	Business and International Management	Business, Management and Accounting (all)	Human Factors and Ergonomics	Organizational Behavior and Human Resource Management
Florida International University	Social Psychology	Management of Technology and Innovation	Organizational Behavior and Human Resource Management	Business, Management and Accounting (all)	Gender Studies
George Mason University	Business and International Management	Social Psychology	Management of Technology and Innovation	Organizational Behavior and Human Resource Management	Education
George Washington University	Business and International Management	Education	Social Psychology	Developmental and Educational Psychology	Arts and Humanities (miscellaneous)
Georgia Institute of Technology	Social Psychology	Business and International Management	Education	Experimental and Cognitive Psychology	Organizational Behavior and Human Resource Management
Griffith University	Education	Public Health, Environmental and Occupational Health	Social Psychology	Organizational Behavior and Human Resource Management	Pediatrics, Perinatology and Child Health
Hofstra University	Developmental and Educational Psychology	Medicine (all)	Business and International Management	Education	Social Psychology
Illinois Institute of Technology	Business and International Management	Psychiatry and Mental Health	Social Psychology	Management of Technology and Innovation	Organizational Behavior and Human Resource Management
Indiana University - Purdue University Indianapolis	Social Psychology	Medicine (all)	Nursing (all)	Arts and Humanities (miscellaneous)	Business and International Management
Kansas State University	Developmental and Educational Psychology	Education	Social Psychology	Business and International Management	Business, Management and Accounting (miscellaneous)
Louisiana State University	Decision Sciences (all)	Social Psychology	NA	NA	NA
Louisiana Tech University	Arts and Humanities (miscellaneous)	Communication	Education	Health Informatics	Language and Linguistics
Michigan State University	Social Psychology	Business and International Management	Education	Management of Technology and Innovation	Organizational Behavior and Human Resource Management
North Carolina State University	Decision Sciences (all)	Social Psychology	Business and International Management	Arts and Humanities (miscellaneous)	Education
Northern Illinois University	Social Psychology	Education	Clinical Psychology	Sociology and Political Science	Developmental and Educational Psychology
Ohio University	Finance	Gastroenterology	Management of Technology and Innovation	Medicine (all)	Social Psychology
Old Dominion University	Business and International Management	Computer Science Applications	Social Psychology	Medicine (all)	Public Health, Environmental and Occupational Health
Pennsylvania State University	Business and International Management	Education	Social Psychology	Management of Technology and Innovation	Organizational Behavior and Human Resource Management
Portland State University	Social Psychology	Business and International Management	Public Health, Environmental and Occupational Health	Management of Technology and Innovation	Finance
Purdue University	Social Psychology	Business and International Management	Developmental and Educational Psychology	Strategy and Management	Decision Sciences (all)
Rice University	Social Psychology	Human Factors and Ergonomics	Education	Behavioral Neuroscience	Experimental and Cognitive Psychology
Roosevelt University	Social Psychology	Clinical Psychology	Biochemistry, Genetics and Molecular Biology (all)	Education	Business and International Management
Saint Louis University	Social Psychology	Business and International Management	Clinical Psychology	Aerospace Engineering	Education
Saint Mary's University	Public Health, Environmental and Occupational Health	Medicine (all)	Business, Management and Accounting (miscellaneous)	Social Psychology	Business and International Management
Seattle Pacific University	Religious Studies	Business and International Management	Organizational Behavior and Human Resource Management	Social Psychology	Developmental and Educational Psychology
Singapore Management University (SMU)	Social Psychology	Business and International Management	Social Sciences (all)	Decision Sciences (all)	Experimental and Cognitive Psychology
Southern Illinois University Carbondale	Social Psychology	Education	Communication	Pathology and Forensic Medicine	Sociology and Political Science
Teachers College, Columbia University	Social Psychology	Education	Organizational Behavior and Human Resource Management	Arts and Humanities (miscellaneous)	Management of Technology and Innovation
Temple University	Social Psychology	Management of Technology and Innovation	Developmental and Educational Psychology	Arts and Humanities (miscellaneous)	Business and International Management
Texas A&M University	Social Psychology	Business and International Management	Organizational Behavior and Human Resource Management	Education	Safety, Risk, Reliability and Quality
University at Albany, SUNY	Social Psychology	Business and International Management	Management of Technology and Innovation	Organizational Behavior and Human Resource Management	Education
University of Akron	Education	Business and International Management	Organizational Behavior and Human Resource Management	Social Psychology	Developmental and Educational Psychology
University of Calgary	Social Psychology	Business and International Management	Pathology and Forensic Medicine	Education	Organizational Behavior and Human Resource Management
University of Central Florida	Social Psychology	Business and International Management	Developmental and Educational Psychology	Management of Technology and Innovation	Organizational Behavior and Human Resource Management
University of Cincinnati	Business and International Management	Education	Management of Technology and Innovation	Arts and Humanities (miscellaneous)	Building and Construction
University of Connecticut	Public Health, Environmental and Occupational Health	Human Factors and Ergonomics	Organizational Behavior and Human Resource Management	Gender Studies	Social Psychology
University of Georgia	Social Psychology	Education	Clinical Psychology	Business and International Management	Organizational Behavior and Human Resource Management
University of Guelph	Business and International Management	Management of Technology and Innovation	Social Psychology	Medicine (all)	Sociology and Political Science
University of Houston	Social Psychology	Education	Business and International Management	Arts and Humanities (miscellaneous)	Sociology and Political Science
University of Illinois at Urbana-Champaign	Social Sciences (miscellaneous)	Education	Social Psychology	Decision Sciences (all)	Experimental and Cognitive Psychology
University of Maryland	Social Psychology	Business and International Management	Sociology and Political Science	Developmental and Educational Psychology	Arts and Humanities (miscellaneous)
University of Minnesota	Education	Business, Management and Accounting (all)	Social Psychology	Business and International Management	Management of Technology and Innovation
University of Missouri-St. Louis	Social Psychology	Education	Business and International Management	Health (social science)	Human Factors and Ergonomics
University of Nebraska at Omaha	Developmental and Educational Psychology	Social Psychology	Education	Business and International Management	Business, Management and Accounting (miscellaneous)
University of North Carolina Charlotte	Business and International Management	Social Psychology	Business, Management and Accounting (all)	Arts and Humanities (miscellaneous)	Education
University of Oklahoma	Business and International Management	Developmental and Educational Psychology	Social Psychology	Education	Health (social science)
University of South Florida	Education	Social Psychology	Medicine (all)	Social Sciences (miscellaneous)	Arts and Humanities (miscellaneous)
University of Texas at Arlington	Social Psychology	Education	Developmental and Educational Psychology	Catalysis	Sociology and Political Science
University of Tulsa	Social Psychology	Education	Business and International Management	Pathology and Forensic Medicine	Arts and Humanities (miscellaneous)
University of Waterloo	Social Psychology	Business and International Management	Sociology and Political Science	Education	Anthropology
University of Western Ontario	Business and International Management	Education	Leadership and Management	Social Psychology	Experimental and Cognitive Psychology
Virginia Tech	Catalysis	Social Psychology	Safety, Risk, Reliability and Quality	Business and International Management	Environmental Science (all)
Washington State University	Business and International Management	Safety, Risk, Reliability and Quality	Clinical Psychology	Human Factors and Ergonomics	Social Psychology
Wayne State University	Business and International Management	Social Psychology	Education	Experimental and Cognitive Psychology	Neuropsychology and Physiological Psychology
Western Michigan University	Education	Experimental and Cognitive Psychology	Management of Technology and Innovation	Developmental and Educational Psychology	Philosophy
Wright State University	Business and International Management	Education	Business, Management and Accounting (all)	Social Psychology	Experimental and Cognitive Psychology

Table 11

Means, Standard Deviations, and Correlations at Program Level of Analysis

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Number of Faculty	5.06	1.91														
2. Total Publication	166.42	126.46	.60**													
3. Interdisciplinary Publications	108.64	87.06	.60**	.95**												
4. IO Publications	57.77	51.71	.46**	.85**	.64**											
5. Interdisciplinary Pubs per Total Pub	0.66	0.14	.04	-.06	.20	-.49**										
6. Total Pubs per Faculty	32.35	21.31	.07	.80**	.75**	.69**	-.12									
7. Interdisciplinary Pubs per Faculty	20.97	14.97	.09	.75**	.81**	.47**	.21	.93**								
8. IO Pubs per Faculty	11.38	9.22	.01	.63**	.42**	.84**	-.62**	.80**	.53**							
9. Total Citations	7669.66	8028.21	.45**	.86**	.75**	.83**	-.22	.70**	.58**	.67**						
10. Interdisciplinary Citations	6432.68	6765.38	.46**	.85**	.77**	.79**	-.17	.69**	.59**	.63**	1.00**					
11. IO Citations	1236.98	1392.54	.35*	.80**	.60**	.94**	-.43**	.69**	.48**	.81**	.92**	.89**				
12. Interdisciplinary Citations per Citation	0.85	0.06	.06	-.15	.08	-.50**	.75**	-.25	.03	-.61**	-.20	-.14	-.45**			
13. Total Citations per Faculty	1490.00	1479.51	.05	.64**	.54**	.66**	-.29*	.77**	.63**	.77**	.87**	.87**	.81**	-.26		
14. Interdisciplinary Citations per Faculty	1245.13	1247.29	.06	.63**	.55**	.62**	-.24	.76**	.64**	.73**	.87**	.87**	.78**	-.20	1.00**	
15. IO Citations per Faculty	244.87	257.65	-.00	.60**	.42**	.77**	-.51**	.76**	.52**	.92**	.79**	.76**	.88**	-.53**	.92**	.88**

Note. * indicates $p < .05$; ** indicates $p < .01$. *M* and *SD* are used to represent mean and standard deviation, respectively.

1. **Table 2.** A list of all programs and all summary statistics. This information is also presented in Tables 2-8 but sorted and filtered by relevance to particular questions.
2. **Tables 3-4.** Rankings of programs by their interdisciplinarity, either raw counts or as a proportion of their total output. Higher ranks in Table 3 indicate greater interdisciplinary publication output, whereas higher ranks in Table 4 indicate greater interdisciplinary focus relative to all work being done there.
3. **Table 5.** Rankings of programs by their I-O centrality, that is, the degree to which they are *not* interdisciplinary, either raw counts or as a proportion of total output. Higher ranks in Table 5 indicate greater I-O publication output.
4. **Tables 6-7.** Rankings of programs by the raw interdisciplinary citations (Table 6) or proportion of I-O interdisciplinary citations (Table 7) they have received. Higher ranks in Table 6 indicate greater overall interdisciplinary impact, whereas higher ranks in Table 7 indicate greater interdisciplinary impact as a proportion of all impact.
5. **Table 8.** Rankings of programs by their I-O influence, that is, the degree to which they are cited by I-O publications. Higher ranks indicate greater influence within I-O.

Importantly, all decisions were based upon Scopus' internal database, and the reliability of that database is not perfect. For example, some conference proceedings have been misclassified as journals (and vice versa), and it is unclear how the subject area categories Scopus uses were derived. We believe the quality to be sufficiently high and consistent that the rankings we created and classifications we developed would not be substantially different with perfect reliability; nevertheless, this remains an important caveat. Small count and/or ranking differences should be interpreted with this limitation in mind. Additionally, it caused the category Catalysis to appear as in Table 10 as the number one non-I-O discipline for Virginia Tech because Scott Geller has published 19 articles in *Bulletin of the Psychonomic Society*, a journal which has not published an issue since 1993, and for some reason, Scopus considers one of that publication's categorizations to be Catalysis. From a manual review of disciplinary assignments, it appears that cases like these are relatively unusual, but this also illustrates why we ultimately went with a popularity metric to determine whether a publication was I-O or not rather than using Scopus' internal categorization scheme.

Results

Although it may seem obvious with the data in front of you, we were surprised at how overwhelmingly popular the *Journal of Applied Psychology* is as an outlet for I-O psychologists in PhD programs, as shown in Table 1. Nearly 1 out of every 10 publications by I-O faculty in PhD programs is in *JAP*, and this rate dwarfs all other outlets. By looking at plateaus in Figure 1, additional tiers emerge. Among core I-O publications, the second tier of popularity includes *Journal of Business and Psychology*, *Journal of Organizational Behavior*, and *Journal of Vocational Behavior*. The third tier is larger, including *Human Performance* through *Organizational Behavior and Human Decision Processes*. The fourth tier includes *Organizational Research Methods* through *Educational and Psychological Measurement*. Beyond that, an extremely large tail appears. Although it is not shown in Figure 1 due to space considerations, I-Os teaching in PhD programs have published in 1,288 distinct journals over their careers. It is a very long tail indeed, with only one publication, across all I-O psychology faculty, appearing in 568 of those journals. For example, only one I-O psychologist ever has published one article each in the journals *Humor* and *Zygon*.¹ Missed opportunities for our field, clearly.

More broadly, perhaps most striking to us was that there appears to be a general productivity factor that crosses disciplinary borders. Faculty/programs who publish more I-O work tend to also publish more interdisciplinary work ($r = .64$). Nevertheless, substantial differences in terms of program focus did emerge. For example, the University of Minnesota, which traditionally is ranked near the top of all I-O programs in terms of overall productivity, scored at the bottom of Table 4, suggesting those faculty much more rarely (32%) publish outside of core I-O psychology journals than within them, although this is relative their general elevated level of productivity (i.e., #1 in IO publications per faculty). In fact, most traditionally highly ranked programs appear toward the middle or end of that table. Nevertheless, many of these programs are highly ranked in terms of raw interdisciplinarity citation impact (Table 6), suggesting that highly ranked I-O programs also tend to publish I-O research that fields outside of I-O psychology find useful, despite not conducting as much interdisciplinary research themselves, relatively speaking. Thus, high-quality research within I-O does appear to be recognized as generalizable to other fields, at least to a degree.

In relation to individual programs, the most interesting interpretive results to us were in examining Tables 4 and 7 and tracking high interdisciplinarity impact programs in other tables. For example, 91% of the citations that Clemson receives come from interdisciplinary publications, with an interdisciplinarity impact ratio of 13022:1229 (from Table 7), and publications coming from that program are 79% interdisciplinary, with a publication ratio of 314:83 (from Table 4). This suggests high impact in literatures outside of I-O psychology that may not be evident at first glance in traditional rankings, most specifically in the areas of social psychology, psychiatry and mental health, and public health (from Table 10). In terms of overall publication rates, Clemson appears lower ranked than would be predicted by their citation rate. This contrast highlights cross-disciplinary differences in impact that are traditionally difficult to interpret.

Discussion and Takeaways

There were many interesting takeaways for us within these tables. We do not have the space to describe them all, but considering the sheer number of tables and the amount of information we needed to leave out of them even so, we thought it might be useful to provide three highlights. First, an emergent finding for our team that is not evident in the tables is that programs with relatively lower interdisciplinarity rarely have that interdisciplinary identity across faculty. Instead, individual faculty members often represent most or the entirety of an interdisciplinary focus of a program. For example, the second most common interdisciplinary publication area for Old Dominion University, where the lead author is currently employed, is “Computer Science Applications.” However, the lead author is also the only person at Old Dominion consistently publishing in this area. Thus, the individual faculty rankings and details available in the web app we created (https://tntlab.shinyapps.io/io_programs/) may be more useful to a would-be graduate student trying to identify an advisor with a certain interdisciplinary focus than the program listing, if that program is not overwhelmingly interdisciplinary.

Second, we were surprised at how high the interdisciplinary citation counts were (see Table 6) in relation to I-O citation counts. All 53 I-O programs listed in the SIOP database have a greater impact on fields outside of I-O psychology than on I-O psychology itself in terms of number of publications influenced. The smallest ratio here was the University of Tulsa, which had 2.56 interdisciplinary citations per I-O citation. The greatest difference was found for Alliant University at San Diego, with 33.88 interdisciplinary citation per I-O citation. In general, the small size of I-O psychology means that any one publication we produce on average has a much greater impact outside of our field than it does within it. Thus,

if a prospective graduate student is interested in “impact” in an absolute sense—minds changed, research influenced—it is even more important to apply to programs with faculty whose work has implications beyond I-O.

Third, we were also surprised to learn how much the productivity and citations rates of “star faculty” tend to influence program rankings. For example, the University of South Florida appears to be cited within I-O psychology dramatically more than any other program, with a raw count of 6050 citations from the core I-O literature, about 2000 greater than either of the next two on the list, Michigan State and the University of Minnesota. However, upon investigation of the person-level data (available in the shiny app), we discovered that they owe a lot of thanks for that to Paul Spector, who brought in 3077 of those citations by himself. This observation led us to investigate the relative impact of “prolific” academics within programs more broadly. Although the University of South Florida has several prolific and highly cited faculty, this varies widely by institution. By using the shiny app, we can easily identify the academics fieldwide most highly cited within I-O psychology articles; in reverse order, the top 10 are Paul Spector, Deniz Ones, Paul Sackett, John Meyer, Chockalingam Viswesvaran, Michael Mumford, Robert Eisenberger, Eduardo Salas, Ann Marie Ryan, and Steve Motowidlo. If any of these people were to leave their programs, the ranking of their program according to I-O citations would immediately and noticeably change, although by varying amounts. The same pattern is true for any metric of choice, whether considering programs citation-wise or publication-wise, within I-O or in general. This suggests some volatility in these rankings in relation to individual faculty members; when one prolific or highly cited person leaves a program, we would expect that program’s ranking to dip despite what would likely be a similar quality of graduate education, and the largest such drops would be in programs with the greatest disparity between the least and most prolific/cited faculty members. In addition to highlighting the high stakes of hiring or replacing faculty, this reveals the riskiness of using program-level publication-based rankings as the sole decision-making tool for undergraduates considering graduate school; thus, we again recommend applicants use all rankings as pieces of information that contribute to their application decisions, not as focal criteria, and to consider both individual faculty profiles (in the shiny app) and program-level metrics.²

In terms of general, practical recommendations for those applying to graduate school, we recommend undergraduates follow a multifaceted decision-making process that weighs the various pieces of evidence for each program individually. This is a remarkably more complex strategy than the standard “apply as highly ranked as your GREs will support” advice that is often provided. Instead, much like needs assessment and job analysis, we recommend undergraduates articulate their career goals and how graduate school figures into them before looking at any rankings. With those goals written down, rankings should be chosen that help reach those goals. The mentors that will help a student have maximal impact within I-O psychology are likely quite different from those that will help them have an interdisciplinary impact. Considering the general shift of all academic disciplines towards interdisciplinary perspective, this will only become more important.

For those seeking an interdisciplinary perspective in their I-O psychology graduate school experience as part of those goals, we recommend a specific process. First, either consult Table 10 for programs that contain the interdisciplinary focus of interest or use the online app to find individual faculty with that interest. Next, consult the other tables to determine how the programs identified rank on other metrics of interest. Finally, consult other non-citation-based rankings, both in this issue of *TIP* and elsewhere, and integrate that information into a holistic picture of a program. In which rankings are your target programs strong and in which are they weak, and which balances are attractive to you? Is there more than one faculty member with the type of interdisciplinary expertise you’re looking for at any particular

program? These questions should all be answered before applying—and frankly, a student able to articulate a specific rationale for applying to a particular school in a personal statement with such information considered would be impressive indeed.

Overall, we hope these rankings provide evidence that “impact” is multifaceted to people applying to graduate school. There is no clear “best” program or set of programs on all dimensions of productivity, and this does not even consider other dimensions of the graduate school experience, such as reactions, specific skills gained, employability, cultural fit, and daily workload. Undergraduates should decide what is most important to them and consider all programs available to them on those terms. We also hope this message extends to those evaluating grant applications or tenure and promotion cases. When interdisciplinarity is considered explicitly, the meaning of “impact” changes. Although within-discipline and interdisciplinary output and impacts are correlated, they are measurably distinct. With this article, its rankings, and our online app, we provide resources for people, particularly those applying to graduate school, to determine the degree of a program’s impact on other disciplines that was not previously possible. We believe it is only through interdisciplinary efforts that I-O psychology will find itself in a position of influence within the broader scientific community, a goal our field has been struggling with for decades. The present study serves as the first systematic assessment of interdisciplinarity in I-O, and we hope it is only the first such effort as I-O continues to evolve to better meet the needs of both I-O psychologists and society more broadly.

Note

¹ Comment from RNL: I really wish I could track how many people Googled “Zygon” as a result of reading this sentence. Perhaps I could get a pub in *Humor* out of it.

² This paragraph was expanded from the originally published version of this article; we thank a reader for calling our attention to some ambiguous language.

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Ranking PhD I-O Programs by Development Opportunities

Nicholas Howald and Sami Nesnidol
Bowling Green State University

Kristin Horan
University of Central Florida

Russell A. Matthews
University of Alabama

Previous rankings of I-O graduate programs have often focused on “objective” criteria related to research outcomes including publication rate and conference representation. Our ranking is differentiated by ranking I-O PhD programs according to development opportunities offered to graduate students in three core areas: teaching, research, and applied practice. Current PhD students were surveyed regarding the development opportunities available to them in their respective programs. We then weighted these opportunities using ratings from current SIOP members with experience in I-O related careers. We found that, under this ranking scheme, the most highly ranked schools varied across the three development areas, suggesting that prospective students should consider their future development and career goals when assessing potential graduate programs. Further implications and limitations of our results are discussed.

An examination of the industrial-organizational (I-O) literature reveals no shortage of rankings of I-O PhD programs (e.g., Beiler, Zimmerman, Doerr, & Clark, 2014; Gibby, Reeve, Grauer, Mohr, & Zickar, 2002; Howard, Maxwell, Berra, & Sternitzke, 1985). Although there are exceptions (e.g., Kraiger & Abalos, 2004), these studies typically rely on metrics such as research productivity, journal prestige, and conference representation. These are important aspects of a program and they deserve to be quantified and investigated. As pointed out by Salter, Allen, Gabriel, Sowinski, and Naidoo (2016) in their Call for Proposals, however, these criteria may be less important for prospective graduate students whose career goals lay outside of research-focused academia. Students interested in applied careers, for example, may desire schools with more opportunities to develop and practice applied skills and thus will place less weight on research productivity in their decision making. This is especially pertinent to a field like I-O psychology, where approximately half of all SIOP members have a career with an applied focus (Silzer & Parson, 2011). Many prospective students may also be interested in an academic career with a focus on teaching. Most existing ranking methodologies do not incorporate information relevant to future teachers and therefore may result in students overlooking programs that excel in providing them with opportunities more closely aligned with their career goals (Salter et al., 2016).

Additionally, “objective” criteria such as publications or other indices of research success commonly used to rank programs (Beiler et al., 2014) fail to account for current student perceptions. Current students’ judgments are likely more pertinent to the needs of prospective students as the experiences of current graduate students are likely to be similar to those of incoming graduate students. To this end, Kraiger and Abalos (2004) used current student judgments on 20 different criteria to create rankings that are relevant for prospective students. They created an overall ranking, as well as rankings on three broad factors (program resources, program culture, and program costs) derived from their 20 criteria. The present study utilizes a similar approach by focusing on three broad factors that are important to I-O PhD programs. However, we developed ours a priori to focus on factors relevant to prospective students’ career trajectories. Heeding the call of Salter et al. (2016), we use ratings from current students to describe I-O PhD programs based on the development opportunities they provide.

Although current graduate students are an effective source of information on the opportunities and resources a program provides to graduate students, they are still in training and therefore, likely to have limited career experience. In comparison, trained I-O psychologists in academic and applied positions are likely to be better judges of the value of various development opportunities for learning the skills necessary to perform well in I-O related jobs. We therefore use current SIOP members employed in I-O related careers (e.g., consulting, research, academia) as subject matter experts (SMEs) on the importance of these development opportunities for the three core areas (teaching, research, and applied practice) instrumental to many I-O careers.

Development Opportunities

We define development opportunities as opportunities that programs provide for students to engage in activities and practices that help students gain skills instrumental to careers as I-O psychologists. We categorize these opportunities into three broad areas: teaching, research, and applied practice. We acknowledge that these areas overlap for many I-O psychologists and that I-O careers often emphasize skills in more than one of these areas. This framework, however, allows prospective students to compare schools across multiple dimensions and make decisions based on the area(s) most related to their future career goals. For example, students who wish to pursue a career as a teaching-focused academic may weight programs' teaching and research development opportunity scores more heavily when choosing which schools to apply to and which to attend. In contrast, a student who is less certain of what I-O career they would like to pursue (e.g., practitioner vs. academic) may choose to apply to schools that rank moderately high in all three development areas, rather than giving preference to the highest-ranking schools in any one area.

Teaching development opportunities provide students with opportunities to develop skills in various aspects of teaching such as managing classrooms, designing courses, evaluating student work, and relaying information to students. Programs that rank highly in this area provide students with more varied teaching experiences throughout their graduate career such as serving as a teaching assistant or instructor of record. We distinguish among several teaching opportunities, including assistantships with administrative duties, assistantships that involve teaching a lab or recitation, and serving as an instructor of record. A full list of these opportunities can be found in Table 1. Such development opportunities are likely to be valued by students pursuing a career in academia, especially those hoping to apply to teaching-focused schools.

Research development opportunities are conceptually the most similar to the traditional ranking criteria described previously. However, we assess opportunities that help students develop the skills necessary to carry out research rather than measuring the outcomes of research (e.g., journal publications). Programs that rank highly in this area encourage research in their students, provide multiple opportunities to learn necessary skills and methods to conduct high quality research, and provide collaborative, research-focused environments. For example, we examine whether programs provide opportunities for funding, collaboration with other researchers, and opportunities for research assistantships. Prospective students interested in a career in academia or an applied career with a research focus will likely benefit from programs offering more of these opportunities.

Applied practice development opportunities help students gain experience in applying I-O psychology research findings to organizations, interacting with organizational stakeholders, and communicating with lay

Table 1
Development Opportunities by Category

Category	Item	Wave 2 SME Rating <i>M</i>	Wave 2 SME Rating <i>SD</i>
Teaching	Opportunities to serve as a teaching assistant with grading or administrative duties	3.33	1.17
	Opportunities to serve as a teaching assistant with duties including the instruction of lab or recitation sessions	3.96	.95
	Opportunities to serve as an instructor of record	4.34	.99
	A graduate level course on teaching or instruction of undergraduate students	3.59	1.05
	Opportunities to gain feedback from faculty on teaching	4.05	.97
	Opportunities for guest lecturing	3.69	.99
	Opportunities to teach a variety of courses and levels	4.23	1.01
	Opportunities to network with alumni in the academic (teaching) world	3.01	1.11
Research	Opportunities to be a research assistant	4.20	.90
	Awards for excellence in research	3.03	1.03
	A graduate level course on up-to-date research methods and statistics	4.48	.72
	A graduate level course or workshop on grant writing	3.07	1.08
	Opportunities to apply for internal funding for graduate student research	3.48	1.04
	Opportunities to apply for external funding for graduate student research	3.37	1.00
	Formal mechanisms (e.g., research groups) that encourage student involvement in student-driven research	3.83	.97
	Formal mechanisms (e.g., research groups) that encourage student involvement in faculty-driven research	4.07	.88
	Class projects that build research skills (e.g., research proposals)	4.07	.88
	Encouragement of collaboration among researchers in other areas, departments, and schools	3.56	1.08
	Conference presence and encouragement for students to attend conferences	4.13	.91
	Opportunities to work with faculty and graduate students who are productive researchers	4.56	.75
	Opportunities to work with faculty and graduate students who share your research interests	4.37	.78
	Opportunities to network with alumni in the academic (research) world	3.60	1.02
	Class projects that build applied skills (e.g., job analysis)	4.03	.92
	A graduate level course on consulting and/or applied topics	3.83	.97
Applied	Opportunities for consulting through faculty	4.11	.94
	An in-house consulting firm	4.00	1.05
	Opportunities for consulting (other than through faculty and in-house consulting firms)	4.28	.91
	Opportunities for applied internships or jobs	4.63	.70
	Opportunities to network with alumni in the applied world	3.91	.99
	Relationships with local businesses	3.84	1.02
	A graduate level course on methods and statistics used in applied work	3.95	.99

Note. *n* = 826. Members of SIOP served as SMEs.

audiences. Programs that rank highly in this area may provide graduate students with opportunities to work on consulting projects overseen by faculty or include courses requiring the completion of projects emphasizing skills commonly used by I-O psychologists in applied settings (e.g., job analyses, performance appraisal). Prospective students interested in a career as a practitioner or as an academic who also consults independently or oversees student consulting projects may be interested in programs ranking highly in this area.

We assess the presence of development opportunities offered by programs in each of these three areas. In addition, the average earliest year in the program during which these opportunities are offered was also factored into the rankings. Programs that offer development opportunities to students earlier in the program allow students more flexibility in choosing when to engage in opportunities, as well as more time spent engaging in the opportunities relevant to their developmental and career goals.

The Present Study

In sum, we use two waves of data collection to rank programs on the extent to which they provide development opportunities in three core areas: teaching, research, and applied practice. In Wave 1, we used judgments from subject matter experts (SMEs) in I-O psychology PhD programs to derive a list of development opportunities within each area. In Wave 2, we collected information about which development opportunities were offered by their respective programs from students in I-O PhD programs. Judgments from professionals currently employed in I-O careers were used to weight the importance of these development opportunities for gaining skills in each of these three core areas.

Method

Wave 1

First, the first three authors independently generated lists of development opportunities for each of the three categories (i.e., teaching, research, and applied practice) before combining and agreeing upon 22 initial criteria. We then administered these initial criteria to a sample of 32 current I-O PhD students from Baruch College, the University of South Florida, and Bowling Green State University. These students served as SMEs for Wave 1. We contacted students from these three programs to ensure a well-rounded view of development opportunities to help prevent a single program from dominating the rankings simply because its students developed the criteria. Participants indicated the perceived helpfulness of each criterion for developing skills in the corresponding area on a five-point Likert scale (1 = *not at all helpful* to 5 = *extremely helpful*). Criteria with mean ratings of three or higher were retained. An open-ended item asking for additional criteria and their perceived helpfulness was included for each development area. After examining the item ratings and open-ended responses, a final list of 31 criteria (14 research, 8 teaching, and 9 applied) was retained for use in Wave 2 (see Table 1).

Wave 2

Participants. In Wave 2, we surveyed student affiliates and members of the Society for Industrial-Organizational Psychology (SIOP) via the SIOP listserv. SIOP members served as SMEs. A total of 396¹ student responses and 826 member responses were used. The 32 participants from Wave 1 were contacted as a part of this effort. In the student sample, 119 (31%) identified as male, and 203 (53%) identified as female, with an average age of 28.20 years ($SD = 6.86$). The modal year in program was second. In the member sample, 340 (41%) identified as male, and 302 (37%) identified as female with an average age of 40.86 ($SD = 12.26$) years.

Procedures. We created separate surveys for SIOP student affiliates and SIOP members. Students were asked to indicate how many development opportunities their current program provided from the list of 31 criteria retained from wave one. Each criterion was rated using a 3-point scale (*yes*, *no*, and *unsure*). Only *yes* responses were considered as an indicator that a program provided that opportunity. Students were also asked to indicate which year in the program (e.g., first year, second year) each criterion was first offered to students. Last, they were asked to indicate to what extent they personally used or engaged in each opportunity offered by their program. This rating was made on a 5-point Likert scale (1 = *not at all* to 5 = *a great deal*). This last metric was used to examine whether students of some programs took advantage of more opportunities than others. These rating did not impact program rankings. To minimize bias, the authors did not provide ratings for their programs.

The SIOP members survey asked participants to rate how effective each of the retained Wave 1 criteria was to developing skills in the corresponding area (e.g., research; from 1 = *not at all effective* to 5 = *extremely effective*). Although not every SME we surveyed was necessarily an expert in every area, we believe averaging across many SME judgments gives a robust assessment of the importance of each opportunity.

Results

Table 1 includes means and standard deviations of SIOP member ratings of each criterion. Each program received a score for each developmental area (i.e., teaching, research, and applied), resulting in three separate indices per program. Scores were calculated through the following steps. First, a weighted sum of the number of development opportunities offered in each area was created for each participant. Criteria were weighted using mean importance ratings from SIOP members. This resulted in three development opportunity scores (teaching, research and applied practice) for each participant. These scores were then averaged across students for each program. To help protect against sampling error, only program scores derived from at least four student responses were calculated. This resulted in three development opportunity scores for each program. Last, each score was adjusted by dividing the average year in which development opportunities in the corresponding area were offered. Therefore, hypothetically, if a program offered every teaching development opportunity in the first year of the program, no adjustment would be made to the program's teaching development opportunity score.

It is worth noting that the correlations between scores adjusted by year and unadjusted scores are high, ranging from .83 to .88. However, adjusting by year gives credit to programs that provide opportunities earlier. We believe that a development opportunity that is accessible earlier in the program is generally more valuable than one that can only be accessed in later years. Students have a limited amount of time in graduate school and earlier access to opportunities allows them more flexibility in choosing which opportunities to pursue, more experience with opportunities they are interested in, and more time to receive feedback and develop their skills in a given area. The mean, standard deviations, and intercorrelations for program scores in each of the three areas are provided in Table 2.

Table 2
Means, Standard Deviations, and Correlations for Program Scores

	<i>M</i>	<i>SD</i>	Teaching score	Research score	Applied score
Teaching score	13.28	3.60	<i>n</i> = 37		
Research score	35.57	10.02	.81*	<i>n</i> = 40	
Applied score	16.18	5.88	.10	.31	<i>n</i> = 40

Note. * $p < .01$. Number of programs with a score in a given category is indicated on the diagonal.

The full rankings of programs are shown in Tables 3 through 5; we indicate the number of student affiliate responses for each program in parentheses. Given concerns such as sampling error, the difference between any two programs close to each other in rankings is unlikely to be practically meaningful. Therefore, we recommend that prospective students not pay too close attention to specific ordering of similarly ranked programs but instead use the tables to obtain a general picture of the opportunities that a program offers relative to the rest of the programs in our sample.

The adjusted rankings were compared to ratings on depth of involvement in opportunities. Interestingly, programs that offered more teaching development opportunities did not have students who were more involved in those opportunities, $r = .17$, $p = .30$. In contrast, programs that offered more research and applied opportunities had students who were more involved in those opportunities, $r = .58$, $p < .001$ and $r = .38$, $p = .02$, respectively.

Discussion

The resulting rankings showcase the variety of PhD programs offered in I-O psychology. Although, many programs appear within the top 50% for all three development areas, very few programs rank highly across all categories. This demonstrates the utility of the criteria used here, as programs' provision of different types of development opportunities appear to be evident to students. Furthermore, it seems unlikely that students are uniformly rating their programs highly on every opportunity offered.

These rankings are useful for prospective graduate students faced with complex decisions about which programs to apply to, visit, and attend. Students can use these results to determine which programs may be best suited to their ultimate career goals. Students with well-defined career goals (e.g., applied practitioner) may choose to place more weight on schools' rankings in one particular area (e.g., applied practice). In contrast, students with less well-defined career goals may opt to apply to programs that rank moderately well across all three development areas. It is worth noting that a low ranking on these lists is not meant as an absolute judgment of a given program—this is not an exhaustive list of all I-O programs and it represents just one method of conceptualizing rankings.

This study has several limitations. First, it is possible that some students purposefully misrepresented their programs (either by artificially inflating or deflating their ratings). As Kraiger and Abalos (2004) point out, this is a problem inherent to all subjective ranking criteria. Although such response distortion may occur, we agree with Kraiger and Abalos (2004) that, when possible, subjective ratings should be used in conjunction with more objective criteria to provide corroborating evidence. Additionally, we removed participants who indicated that their program provided all possible development opportunities and no participants indicated their program had fewer than 4 opportunities. Lastly, the rankings indicate that no program is in the top five for all categories, providing evidence that the effects of response distortion were likely limited.

We also adjusted raw scores in each development opportunity based on the earliest year opportunities were offered. This rewards programs who provide opportunities to students earlier in their graduate training. We acknowledge that there may be some situations where this does not necessarily promote development. For example, offering students the chance to teach a course early in their career without proper training may be detrimental to growth as a teacher. Nonetheless, again, we believe that a tendency to offer development opportunities earlier rather than later is ultimately beneficial to graduate students. As mentioned, the correlations between adjusted and unadjusted scores are very high, indicating that this

Table 3

Program Rankings in Teaching Development Opportunities

Ranking	Program
1	Texas A&M University (7)
2	University of Minnesota (9)
3	Northern Illinois University (5)
4	University of Georgia (10)
5	Michigan State University (11)
6	George Mason University (16)
7	Bowling Green State University (9)
8	Saint Louis University (4)
9	Auburn University (11)
10	University of Akron (12)
11	University of Oklahoma (9)
12	University of Missouri - St. Louis (12)
13	University of South Florida (4)
14	Colorado State University (11)
15	Old Dominion University (6)
16	Florida International University (7)
17	Clemson University (6)
18	Pennsylvania State University (6)
19	University of Connecticut (5)
20	Baruch College (19)
21	Portland State University (5)
22	Rice University (15)
23	George Washington University (6)
24	State University of New York at Albany (6)
25	University of Nebraska at Omaha (4)
26	University of Central Florida (6)
27	Roosevelt University (5)
28	University of Houston (10)
29	Louisiana Tech University (16)
30	Central Michigan University (8)
31	Florida Institute of Technology (5)
32	Illinois Institute of Technology (17)
33	University of Illinois at Urbana-Champaign (6)
34	The Chicago School of Professional Psychology (4)
34	Teachers College, Columbia University (6)
36	Capella University (8)
37	Grand Canyon University (16)

Note. Numbers in parentheses indicate sample size of student responses from that institution. Only programs with at least four responses are included in this table.

Table 4

Program Rankings in Research Development Opportunities

Ranking	Program
1	University of Minnesota (9)
2	University of Georgia (10)
3	Michigan State University (11)
4	Texas A&M University (7)
5	Pennsylvania State University (6)
6	Old Dominion University (6)
7	Florida International University (7)
8	University of South Florida (4)
9	University of Houston (10)
10	Colorado State University (11)
11	Roosevelt University (5)
12	Northern Illinois University (5)
13	Portland State University (5)
14	University of Nebraska at Omaha (4)
15	University of Missouri - St. Louis (12)
16	Auburn University (11)
17	Saint Louis University (4)
18	George Mason University (16)
19	Bowling Green State University (9)
20	Louisiana Tech University (16)
21	University of Connecticut (5)
22	Clemson University (6)
23	University of Oklahoma (9)
24	Baruch College (19)
25	Rice University (16)
26	Central Michigan University (8)
27	University of Akron (12)
28	George Washington University (6)
29	Teachers College, Columbia University (8)
30	State University of New York at Albany (6)
31	Illinois Institute of Technology (17)
32	University of Central Florida (7)
33	University of Illinois at Urbana-Champaign (6)
34	Florida Institute of Technology (5)
35	The Chicago School of Professional Psychology (4)
36	University of Phoenix (6)
37	Walden University (7)
38	Alliant International University (5)
39	Grand Canyon University (17)
40	Capella University (9)

Note. Numbers in parentheses indicate sample size of student responses from that institution. Only programs with at least four responses are included in this table.

Table 5

Program Rankings in Applied Development Opportunities

Ranking	Program
1	Louisiana Tech University (16)
2	Pennsylvania State University (6)
3	Roosevelt University (5)
4	The Chicago School of Professional Psychology (4)
5	Illinois Institute of Technology (17)
6	Alliant International University (4)
7	Michigan State University (11)
8	University of Nebraska at Omaha (4)
9	University of Houston (10)
10	Bowling Green State University (9)
11	Clemson University (6)
12	Saint Louis University (4)
13	University of South Florida (4)
14	Old Dominion University (6)
15	University of Akron (11)
16	Portland State University (4)
17	Florida Institute of Technology (5)
18	University of Georgia (10)
19	George Mason University (16)
20	Rice University (14)
21	University of Minnesota (9)
22	Colorado State University (11)
23	Northern Illinois University (5)
24	University of Connecticut (5)
25	University of Central Florida (6)
26	State University of New York at Albany (6)
27	George Washington University (6)
28	Texas A&M University (7)
29	Florida International University (7)
30	University of Oklahoma (9)
31	University of Missouri - St. Louis (12)
32	Central Michigan University (8)
33	Teachers College, Columbia University (6)
34	Grand Canyon University (16)
35	University of Phoenix (6)
36	Auburn University (11)
37	Walden University (6)
38	Capella University (8)
39	Baruch College (19)
40	University of Illinois at Urbana-Champaign (6)

Note. Numbers in parentheses indicate sample size of student responses from that institution. Only programs with at least four responses are included in this table.

adjustment does not greatly affect rankings. However, it does result in some changes to rank ordering. Interested scholars can contact the corresponding author to obtain the unadjusted rankings.

The median number of students admitted to an I-O PhD program each year is about four (Tett, Walser, Brown, Simonet, & Tonidandel, 2013). Given the relatively small number of PhD students who are likely to be in a program at any given time, our rankings are subject to sampling error. Fortunately, the programs in the top 50% of each category had an average of 8.37 responses each. Nonetheless, rankings for programs with small sample sizes should be viewed with some caution. In addition, some subjectivity is expected in ratings. Averaging across student ratings may hide substantial variability in how students perceive, experience, and utilize development opportunities in a program. Different students will likely have somewhat qualitatively different experiences in the same program. Despite this, we found that, on average, raters tended to demonstrate high within-program agreement on scores in each development opportunity area (average ICC(2) = .93).

Conclusion

In this study, we focused on parsimonious and broad criteria with prospective I-O PhD students as the intended audience. In general, it is important to note that no single ranking system is perfect. There are numerous criteria on which programs can be ranked and these criteria may differ in importance depending on who is using the rankings (e.g., current faculty, prospective students). The source of data may also affect rankings—perceptions of current students may differ from those of current faculty. It would be advantageous for prospective students to use our rankings in conjunction with other criteria (e.g., match with faculty research interest, publication rate, location). Many previously published rankings (e.g., Beiler et al., 2014; Gibby et al., 2002; Kraiger & Abalos, 2004) and other rankings created in response to the Call for Proposals by Salter et al. (2016) provide useful information on I-O programs and should also be consulted by prospective students. Overall, ranking I-O PhD programs on development opportunities provides a practically useful complement to other ranking methodologies.

Note

¹ We removed nine participants who indicated that their program provided all possible development opportunities, as this could indicate artificial rating inflation. These nine participants were each enrolled in a different I-O program.

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I-O Graduate Programs Rankings Based on Student Perceptions

Jenna-Lyn R. Roman¹ Christina N. Barnett² and Erin M. Eatough³
Baruch College, CUNY¹, University of South Florida²,
Baruch College & The Graduate Center, CUNY³

Graduate program rankings occur within the industrial-organizational psychology community on a frequent basis. These rankings are calculated in a myriad of ways: research productivity of faculty (Levine, 1990; Winter, Healey, & Svyantek, 1995), number of faculty serving on editorial boards (Jones & Klimoski, 1991), number of student conference presentations (Payne, Succa, Maxey, & Bolton, 2001; Surette, 1989, 2002), expert opinions such as *U.S. News and World Reports* (1995; 2001), and finally - student perceptions (Kraiger & Abalos, 2004). Although all of the aforementioned methods provide valuable information to both incoming students and current faculty alike, we suggest that student perceptions provide a unique insight that can add value to the ranking of graduate programs, particularly for prospective I-O graduate students.

Kraiger and Abalos (2004) suggested that the perspective of current graduate students is both important and necessary. They used graduate student opinions to create a set of criteria, ratings of programs based on that criteria and in turn, rankings. In doing so, Kraiger and Abalos set several important precedents in industrial-organizational psychology graduate program ratings. First, they used current graduate students as subject matter experts (SMEs) in order to determine which criteria students value the most, a novel step in I-O program rankings. Second, they measured the perspectives of students from both doctoral programs and master's programs. This is important because SIOP lists 157 MA and MS programs from which potential students can choose, but there is little ranking information available to guide these students in their decision besides what is provided on each program's website or the searchable I-O program database on the SIOP website. Having an available and updated source for program comparison based on information provided by students currently at the programs they hope to attend would be invaluable to prospective MA/MS students.

Following their lead, we aimed to conduct student program ratings using similar methodology to Kraiger and Abalos (2004) with the goal of updating their previous rankings and offering a unique (student) perspective to the broader effort on program rankings.

Support and Criticism for Program Rankings

Program directors, faculty members, and students have a range of stances regarding program rankings, ranging from eager to cautious to completely distrustful of the results of any type of program ranking method. However, in defense of rankings, it is unwise for any organization to ignore the perspective of its customers ("Why customer satisfaction is important," n.d.). In the case of graduate programs, the customers are the students. Prospective students, much like consumers choosing a new product or home, are likely looking for product information to make consequential decisions. The ranking of the schools can be one such piece of information gathered in an assessment process. It is information that prospective students, the consumers, may desire during their decision making processes.

However, it has been noted extensively that program rankings are not a flawless means by which to measure program quality. Kraiger and Abalos (2004) provided examples of ranking flaws: "rankings based on program reputation may be unrelated to current faculty productivity given halo (general reputation of the university), turnover, or raters who do not fully understand the discipline or activities of

individual institutions” (p.28), demonstrating serious issues that must be considered when interpreting rankings. Still, we contend that although rankings may be flawed, they are an inescapable fact of a competitive academic market. Indeed the very approach we take here, that of rankings based on graduate student opinion, are not impervious to error. For example, it is natural for graduate students to believe that their program is a top program and rate it accordingly. Confirmation bias tendencies make it more likely for students to interpret and recall information that confirms their program is elite because that confirms their preexisting beliefs (i.e., that they chose a top program to attend, they made a good decision; Plous, 1993). Furthermore, students typically only have experience with one program. Thus, different from a consumer who may have experience with many brands, students only have their own individual experience with one individual program, which gives them little basis by which to evaluate it. However, despite these considerations, we believe that the information provided by such rankings can offer value as they do represent the lived experience of the very population graduate programs serve.

The Utility of Student Perceptions for Program Rankings

Using student perceptions in graduate rankings can be particularly valuable for both the prospective students and for the graduate programs who serve them. In terms of the prospective students, as mentioned, information gathering about programs prior to making a significant life commitment is natural, yet limited comparative information is available that reflects the student experience in programs. Kraiger and Abalos (2004) had produced a program ranking by using scores collected from current graduate students on criteria that were previously deemed important by current graduate students. This method resulted in rankings on a diverse grouping of criteria such as student perceptions of faculty support and accessibility, instruction quality, balance between applied and academic emphases, and cost of living. These are all factors prospective students may consider when choosing a program for the next stage of their academic career. Students have to make decisions that can influence the rest of their life and therefore information about programs (both positive and negative) may aid them during this process.

However, ranking based on student perceptions are not just potentially valuable to the prospective students shopping for programs. Student perceptions are also important for the graduate programs themselves. Because these rankings are based on criteria current students deem as important, these rankings can be used by programs as a way to develop areas of their program to better target prospective students. For example, programs can leverage the findings from the ratings to build a case to administration for program development purposes. For example, programs may ask for more internally funded research or teaching positions for graduate students if these areas are rated particularly low relative to other programs (Kraiger & Abalos, 2004). In addition, if programs are able to use the rankings to secure better funding opportunities for students, it should be beneficial for recruiting future applicants to the program.

Method

The authors of this article followed a similar methodology to the one used in Kraiger and Abalos (2004) to (a) determine the criteria graduate students deem important, (b) weigh the importance for those criteria, and (c) compute the total score for each program. This information was then used to determine the overall ranking of programs.

This project was conducted in two phases: a criterion development phase and an importance and rating phase. Both phases of the data collection were in conjunction with another project on student perceptions from Bowling Green State University. The initial criterion development phase was conducted with current I-O graduate students ($N = 46$) listing the criteria they used to evaluate or choose a graduate

program (e.g., research interests of faculty, location, availability of funding). This phase had student responses from 3 different universities and colleges, with approximately two-thirds of students enrolled in PhD programs and the remaining one third enrolled in MS/MA programs. Students responded to the open-ended question, “List any and all criteria used when selecting your graduate program or that you use when recommending a program to another person.” The resulting responses were combined into 25 criteria and definitions of the criteria were written. See Table 1 for the final list of 25 variables.

Table 1
Graduate Student Criteria

Criteria	Definitions
Application process	Admission requirements
Alumni network	Success of alumni and connection of alumni to the program
Class offerings	Topics of interest offered and class times offered
Cost	Tuition, fees, and program-related expenses incurred due to program attendance
Facilities available	Labs, office space, technology options, statistical packages, journals access
Faculty quality/expertise	Quality of class instruction, salience of research advice, depth and breadth of faculty knowledge
Faculty productivity	Quality and quantity of graduate faculty journal publications and conference presentations
Faculty research interests	Major professor and other professors with research interests similar to yours
Teaching opportunities	Availability for students to student teach, lecture classes, serve as a teaching assistant
Funding resources	Financial package available to student, relationship between stipend amount and cost-of-living
Graduation requirements	Requirements are reasonable and match with student's goals (e.g., having internship requirements when a student is interested in going applied)
Internship opportunities	Availability of suitable internships to the program's students
Job/Internship placements	Successful placements of current students and alumni in appropriate internships and jobs
Location	Geographic qualities around the campus, access to nearby job/internship opportunities, cost of living
Opportunities for applied projects	Availability do consulting projects and other types of applied work as part of the program
Program culture	Atmosphere of the program, norms, collaborative vs. competitive
Program flexibility	Opportunity for student to arrange their schedule to fit other facets of their life, take a semester off for life events
Program ranking	Knowledge of a program's current ranking (e.g., <i>U.S. News & World Report</i>)
Program reputation	Knowledge of a program's reputation in I-O

Quality of life/fit and social relationships between grad students	Social fit with and relationships between students within the program
Research opportunities	Availability for students to engage in research that relates to their topics of interest within the program
Student productivity	Quality and quantity of graduate student journal publications and conference presentations
Student support by faculty/department	Mentoring availability and formal and social interactions between the student and the faculty/department. Faculty accessibility to students.
Teaching model used	Balance between applied and academic focus
Learn practical skills	Relevant skills are learned by students that will be useful in I-O internships and jobs.

The second phase, the main data collection which involved collecting importance scores and ratings, involved a widely distributed survey. Data collection for this phase began in September of 2017. The survey was administered to current graduate student participants from I-O MA/MS and PhD programs across the country. The researchers distributed a Qualtrics survey administered to all affiliates of SIOP through the SIOP listserv. To augment the number of student participants for this study, particularly MA/MS students, SIOP distributed the study link to I-O program directors so that they could email it directly to their students.

Respondents were told that the purpose of this study was “to collect perceptions of the quality of the graduate programs from the perspective of their customers—the graduate students.” Participants were asked to rate the importance of the 25 criteria, in general, from their perspective as a current graduate student. A sample question for class offerings asked participants to rank the importance of class offerings for choosing a graduate school from your perspective as a current graduate student: “topics of interest offered and/or the class times that courses are offered.” Ratings were collected on a four-point Likert-type scale (1=*not important at all* to 4 = *very important*). The highest possible score for programs was 100.

Students were then also asked to rank the quality of *their program* on each of the 25 criteria. A sample item asked “Please provide your perceptions on how the following variables relate to the quality of the graduate program in which you are currently enrolled. Only answer this section if you are currently enrolled as a student in a graduate program (e.g., Class Offerings).” Ratings for that variable were collected on a four-point Likert-type scale (1 = *extremely poor class offerings* to 4 = *extremely good class offerings*). With the exception of two items (i.e., application process, graduation requirements) that had 3- point Likert scales, all other items were ranked by participants using a 4-point Likert-type scale with anchors tailored to the specific item. Students also provided demographic information. All surveys were completed anonymously.

Notably, students from both MA/MS and PhD programs were included and provided importance ratings and rankings on the criteria. We expected that some criteria items may be differentially important to master’s students versus doctoral students but allowed the importance ratings to elucidate that information for us. Study respondents from each type of program dictated through the importance ratings, which items were key drivers to them. See Tables 2 and 3 for the list of which variables were included in the importance ratings for PhD and MA/MS programs respectively.

Table 2

Criteria for Calculating PhD Rankings

Criteria included PhD rankings	Importance rating	Criteria not included for PhD rankings
Alumni network	-0.050109499	Application process
Class offerings	0.283953825	Facilities available
Cost	0.395308266	Graduation requirements
Faculty quality/expertise	1.917152296	Internship opportunities
Faculty productivity	0.061244943	Location
Faculty research interests	1.10055306	Program flexibility
Funding resources	1.026316766	Program ranking
Job/Internship placements	0.692253443	Student productivity
Learn practical skills	1.211907502	Teaching opportunities
Opportunities for applied projects	0.061244943	
Program culture	1.917152296	
Program reputation	-0.347054675	
Quality of life/fit and social relationships between grad students	0.09836309	
Research opportunities	0.914962325	
Student support by faculty/department	1.397498237	
Teaching model used	0.09836309	

Table 3

Criteria for Calculating MA/MS Rankings

Criteria included MA/MS rankings	Importance rating	Criteria not included for MA/MS rankings
Application process	-0.753117766	Faculty productivity
Alumni network	0.329699052	Program ranking
Class offerings	1.001792249	Student productivity
Cost	0.591068628	Teaching opportunities
Facilities available	-0.902471809	
Faculty quality/expertise	1.860578	
Faculty research interests	-0.454409678	
Funding resources	0.030990964	
Job/internship placements	1.412515869	
Learn practical skills	2.009932044	
Location	-0.043686058	
Opportunities for applied projects	0.703084161	
Program culture	1.07646927	
Program flexibility	-0.93981032	
Program reputation	0.217683519	
Quality of life/fit and social relationships between grad students	-0.155701591	
Research opportunities	-0.977148831	
Student support by faculty/department	0.964453738	
Teaching model used	0.66574565	

Importance ratings followed by student rankings on the program criteria were then used to determine the rankings of programs based on what graduate students deemed important (giving criteria with higher importance more weight) and how they rated their program. To calculate the overall program rankings, we separated PhD and masters programs and developed separate weights for each program type. We included all criteria that were above the mean level of importance rating as well as all criteria that were one standard deviation below the mean level of importance rating. By doing this we were able to exclude criteria that the sample did not rate as important (9 criteria for PhD students, 4 criteria for MA/MS students were excluded from ranking calculations). See Tables 2 and 3 for the list of which variables were included in the importance ratings for PhD and MA/MS programs respectively. After obtaining the mean importance ratings for each item, we calculated a weight for each criterion. The weight was the importance rating for each criterion subtracted from the mean importance rating of the total criteria set, divided by the standard deviation of the importance ratings. The weights for each criterion were then multiplied by the mean rating on that criterion from each program. The sum of all of the weighted criteria provides the rank for each program.

This study received institutional review board approval and approval from the Institutional Research Committee at SIOP. SIOP was instrumental in facilitating the collection of data for this study. The Institutional Research Committee required that to protect the identity of participants, programs with fewer than four respondents could not be analyzed for importance ratings or rankings. Therefore, programs with students who did not wish to participate or program directors who did not distribute the study information to their students were not included in these analyses. We can make no assertions as to the quality or hypothetical ranking of such programs. Simply because a program is not included on our list does not imply that it is not a quality program.

Results

Ratings were obtained from 1,049 current PhD and MA/MS students. We received data that met our inclusion criteria of having *N*s greater than or equal to 4 from 44 PhD programs and 48 MA/MS programs. The SIOP website states that there are 78 psychology PhD programs and 125 PhD programs total (which includes those programs housed in psychology departments, business departments, etc.). This website also states that there are 157 MA/MS programs. There were some programs from which we did not receive data, which could be due to various reasons (e.g., students are not current SIOP members and did not receive the notification about the study, program directors chose not to forward the study recruitment information on to their students). There were a few programs in which we did not receive enough data to include their program in the rankings, which was unfortunate. We chose to report the top 20 PhD and MA/MS programs respectively for two reasons: (a) to showcase those truly exceptional programs and (b) to shield programs that had strong participation in this study but were scored less favorably than other programs by their students.

MA/MS (*N* = 583) student respondents were primarily female (*N* = 340), with *N* = 190 being male and *N* = 9 selecting either prefer not to answer or not providing a response on this item. The average age of these respondents was 26.26 (*SD* = 6.02). Of the MA/MS students surveyed 66% were Caucasian, 9% were Asian, 8% selected Other, 8% were Hispanic/Latino(a), 5% were Black or African American, and 2 respondents were American Indian or Alaskan Native. On average the MA/MS students in our study had an average start year of 2016 (*SD* = .70), had been in their current program for approximately one and half years (*M* = 1.53, *SD* = .46) years, and estimate their degree completion in 2018 (*SD* = .59).

Similar to the MA/MS sample, of the responding 466 doctoral students, $N = 276$ were female, $N = 161$ were male, and $N = 18$ selected either prefer not to answer or did not provide a response on this item. The average age of these respondents was approximately 29 years old ($M = 28.85$, $SD = 7.41$). The racial makeup of the PhD students was also analogous to the MA/MS students, and 68% of PhD students surveyed were Caucasian, 9% were Asian, 5% selected Other, 5% were Hispanic/Latino(a), 4% were Black or African American, and one respondent was American Indian or Alaskan Native. The PhD students reported an average start year of 2014 ($M = 2014$, $SD = 1.98$), had been in their current program for more than 3 years ($M = 3.32$, $SD = 1.75$) years, and estimate degree completion in 2019 ($M = 2019$, $SD = 1.42$).

Table 4

Top 20 PhD Overall Based on Student Rankings

Rank	Program	N	Raw score	Z-score
1.	Portland State University	5	38.348	1.721
2.	Pennsylvania State University	10	38.064	1.615
3.	Michigan State University	10	37.629	1.453
4.	Texas A&M University	8	37.582	1.435
5.	Old Dominion University	9	36.766	1.169
6.	University of South Florida	4	36.759	1.128
7.	Rice University	14	36.263	.943
8.	University of Georgia	12	36.052	.864
9.	Columbia Teacher's College	9	35.830	.781
10.	George Mason University	22	35.772	.760
11.	Louisiana Tech University	18	35.484	.652
12.	Wayne State University	6	35.452	.640
13.	University of Minnesota	7	35.406	.623
14.	Northern Illinois University	5	35.018	.478
15.	University of Houston	10	35.012	.476
16.	Seattle Pacific University	10	35.002	.472
17.	University of Missouri–St. Louis	11	34.989	.467
18.	University of Oklahoma	9	34.820	.404
19.	Florida International University	7	34.819	.404
20.	University of Akron	15	34.739	.374

Table 5

Top 20 MA/MS Programs Overall Based on Student Rankings

Rank	Program	N	Raw score	Z-score
1.	Xavier University	19	32.107	1.865
2.	University of Tennessee at Chattanooga	18	31.764	1.706
3.	Appalachian State University	13	31.058	1.379
4.	New York University	4	30.619	1.176
5.	Middle Tennessee State University	25	30.597	1.166
6-tie.	San Diego State University	5	30.329	1.041
6-tie.	University of Maryland, College Park	12	30.329	1.041
8.	George Mason University	15	30.027	.902
9.	Missouri State University	21	29.874	.831
10.	Columbia Teacher's College	21	29.785	.789

11.	University of Akron	8	29.778	.786
12.	Radford University	19	29.737	.767
13.	Hofstra University	11	29.614	.710
14.	Florida Institute of Technology	6	29.526	.670
15.	Minnesota State University–Mankato	17	29.489	.652
16.	Chicago School of Professional Psychology	17	29.448	.633
17.	University of Guelph	8	29.058	.453
18.	University of Georgia	18	28.947	.401
19.	Wayne State University	5	28.756	.313
20.	Indiana University-Purdue University Indianapolis	6	28.717	.295

In an effort to highlight the specific criteria that are most important to I-O graduate students and to provide more information on certain program characteristics that may be of interests to faculty and students we provide that information here. The top five criteria PhD students ranked highest were faculty quality/expertise ($M = 3.83$), program culture ($M = 3.70$), student support by faculty/department ($M = 3.69$), learn practical skills ($M = 3.64$), and faculty research interests ($M = 3.61$). The top five criteria MA/MS students ranked highest were the opportunity to learn practical skills ($M = 3.85$), followed by faculty quality/expertise ($M = 3.81$), job/internship placements ($M = 3.69$), program culture ($M = 3.60$), and class offerings ($M = 3.58$). The following tables below are the program rankings based on the top three criteria that were rated as highly important to both PhD and MA/MS students.

Table 6
Rankings of Program Culture

Rank	PhD programs	Score	Rank	MS/MA programs	Score
1.	Old Dominion University	3.89	1-tie.	Indiana University-Purdue University Indianapolis	4.00
2.	University of Akron	3.87	1-tie.	Keiser University	4.00
3-tie.	Wayne State University	3.83	1-tie.	University of Guelph	4.00
3-tie.	Clemson University	3.83	4.	Xavier University	3.95
5-tie.	Pennsylvania State University	3.80	5.	George Mason University	3.88
5-tie.	Portland State University	3.80	6.	Appalachian State University	3.85
7.	University of Oklahoma	3.78	7.	Florida Institute of Technology	3.83
8.	Texas A&M University	3.75	8-tie.	Missouri State University	3.78
9-tie.	Florida International University	3.71	8-tie.	University of Tennessee at Chattanooga	3.78
9-tie.	Rice University	3.71	10.	Carlos Albizu University	3.77
11.	Seattle Pacific University	3.70	11-tie.	California State University, Long Beach	3.75
12.	University of Georgia	3.67	11-tie.	Elmhurst College	3.75
13-tie.	George Mason University	3.64	11-tie.	University of Nebraska at Omaha	3.75
13-tie.	University of Missouri-St. Louis	3.64	14-tie.	University of West Florida	3.71
15.	Teachers College, Columbia University	3.63	14-tie.	University of Wisconsin-Stout	3.71
16-tie.	Michigan State University	3.60	16.	University of Maryland, College Park	3.69

16-tie.	Northern Illinois University	3.60	17-tie.	Minnesota State University-Mankato	3.67
16-tie.	Hofstra University	3.60	17-tie.	Missouri University of Science and Technology	3.67
16-tie.	Chicago School of Professional Psychology	3.60	19-tie.	Hofstra University	3.64
20.	Florida Institute of Technology	3.58	19-tie.	Middle Tennessee State University	3.64

Table 7

Learn Practical Skills

Rank	PhD programs	Score	Rank	MS/MA programs	Score
1.	Louisiana Tech University	3.94	1-tie.	East Carolina University	4.0
2.	Michigan State University	3.89	1-tie.	Illinois Institute of Technology	4.0
3.	Alliant International University	3.75	1-tie.	Keiser University	4.0
4-tie.	Pennsylvania State University	3.70	1-tie.	San Diego State University	4.0
4-tie.	Seattle Pacific University	3.70	1-tie.	Seattle Pacific University	4.0
6.	Columbia Teachers College	3.63	1-tie.	University of Georgia	4.0
7-tie.	Keiser University	3.60	1-tie.	University of Nebraska at Omaha	4.0
7-tie.	Portland State University	3.60	1-tie.	University of Texas at Arlington	4.0
9.	Florida Institute of Technology	3.55	1-tie.	University of West Florida	4.0
10-tie.	University of Connecticut	3.50	1-tie.	Wayne State University	4.0
10-tie.	University of Houston	3.50	1-tie.	West Chester University	4.0
10-tie.	University of Tulsa	3.50	12.	University of Tennessee at Chattanooga	3.94
13.	University of Akron	3.47	13.	Carlos Albizu University	3.93
14-tie.	Illinois Institute of Technology	3.44	14-tie.	California State University, Long Beach	3.92
14-tie.	Old Dominion University	3.44	14-tie.	University of Maryland, College Park	3.92
16-tie.	Roosevelt University	3.40	16-tie.	Hofstra University	3.91
16-tie.	Chicago School of Professional Psychology	3.40	16-tie.	University of Baltimore	3.91
18.	Central Michigan University	3.38	18.	University of Maryland, Baltimore County	3.90
19.	Wayne State University	3.33	19-tie.	Minnesota State University - Mankato	3.89
20-tie.	Texas A&M University	3.29	19-tie.	Xavier University	3.89
20-tie.	University of Guelph	3.29			

Table 8

Faculty Quality

Rank	PhD programs	Score	Rank	MS/MA programs	Score
1-tie.	Portland State University	4.00	1.	Keiser University	4.00

1-tie.	University of South Florida	4.00	2-tie.	Indiana University-Purdue University Indianapolis	3.83
3.	Michigan State University	3.90	2-tie.	University of Tennessee at Chattanooga	3.83
4.	Texas A&M University	3.88	4-tie.	George Mason University	3.80
5-tie.	Rice University	3.86	4-tie.	San Diego State University	3.80
5-tie.	University of Minnesota	3.86	4-tie.	Wayne State University	3.80
7.	University of Georgia	3.83	7-tie.	University of Akron	3.75
8.	Pennsylvania State University	3.80	7-tie.	University of Minnesota Duluth	3.75
9.	Columbia Teacher's College	3.75	9.	Appalachian State University	3.69
10.	University of Missouri–St. Louis	3.73	10.	University of Maryland, College Park	3.67
11.	Florida International University	3.71	11.	University of Baltimore	3.64
12.	Clemson University	3.67	12.	Missouri State University	3.62
13.	George Mason University	3.64	13-tie.	Middle Tennessee State University	3.60
14.	Louisiana Tech University	3.61	13-tie.	New York University	3.60
15-tie.	Hofstra University	3.60	15.	Columbia Teacher's College	3.56
15-tie.	Northern Illinois University	3.60	16-tie.	Florida Institute of Technology	3.50
15-tie.	University of Illinois at Urbana Champaign	3.60	16-tie.	Keiser University	3.50
18.	Bowling Green State University	3.56	16-tie.	Missouri University of Science and Technology	3.50
19-tie.	University of Central Florida	3.50	16-tie.	Touro College	3.50
19-tie.	University of Phoenix	3.50	16-tie.	University at Albany, SUNY	3.50

Discussion

The overarching goal of this research was to provide valuable information to both incoming students and current faculty about I-O graduate programs. We believe that using the perceptions of current students provides unique insight into ranking graduate programs. Regardless of the method for determining which program to attend, prospective students are driven to attend the best program possible. As we have shown through this research and as evidenced by the other I-O program rankings notated above—there are many ways to evaluate said programs. A secondary aim of this research was to provide rankings for MA/MS programs in addition to the more frequent PhD program rankings. Even though it can be more challenging to find methods for ranking master's programs, students who wish to attend those programs should have a resource similar to students evaluating PhD programs.

That said, we must acknowledge that in the process of this research we observed that “program ranking” was *not* an important criterion for students. It was indeed one of the lowest factors of consideration for students from both PhD and masters programs. This may indicate that some of our presumptions about the use or practical value of rankings, at least for prospective students, were incorrect. It may be that the more fine-grained information such as the ratings of specific criteria is more useful (e.g. one student may very much care about funding packages whereas another student may very much care about research opportunities).

Furthermore, we want to also note that the samples collected from each institution may be biased. Students who were either very happy or very disgruntled may be those who were the most motivated to respond to our inquiry. Furthermore, students who are more research-focused may have been overrepresented here and those interested in teaching or applied work underrepresented as “teaching opportunities” was rated as low on importance in these samples as was “internship opportunities” in PhD programs.

We want to underscore that programs that were not included in the top 20 PhD or MA/MS programs may also be high quality. Also, any unique method of ranking programs will likely produce different results. We realize that this type of research has its drawbacks (e.g. potential biases of the raters as they are already in their chosen program) and that not all academics support the use of program rankings. We want to underscore that there may be a number of reasons that any given program could have been omitted from these rankings but that does *not* include the program is low in quality. However, we hope that this work has provided a useful update to previous attempts at student driven rankings of I-O graduate programs.

Ms. Roman and Ms. Barnett wish to thank Dr. Erin Eatough and **Dr. Charles Scherbaum** for serving as faculty advisors for this project as their advice and guidance were crucial. We also wish to acknowledge **Ms. Stefanie Gisler** and Ms. Sabrina Yu for their valuable contributions to the project.

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SIOF 2018–Chicago Conference Highlights

Tracy Kantrowitz
Program Chair

Daisy Chang
Conference Chair

The SIOF 2018 conference is almost here! This year’s conference includes many new opportunities for learning and networking. Here is your guide to the highlights in Chicago! For additional detail on sessions and speakers, see the [Conference Program article in the January 2018 TIP](#) or use [SIOF’s searchable program](#).

Throughout the Conference and Program:

- Over 980 sessions and posters across the 3- day program
- Over 600 posters across 19 poster sessions
- 46 Reproducible Research (RR) presentations that facilitate the sharing of code and techniques with attendees; for more information see here: www.siof.org/rr
- 59 multidisciplinary sessions that feature collaborations, research initiatives, and unique projects with expertise from multiple disciplines beyond I-O
- 54 sessions with alternative formats (a new record!)
- 14 Communities of Interest (in Mayfair on Thursday and Friday)
- 16 Master Tutorials
- 7 Debates (ethical assessments, professional practice issues, the future of work, competency modeling, employee surveys, feedback on assessments, value of exit interviews)
- SIOF’s mobile app keeps you connected to the conference and gives YOU the ability to provide feedback on sessions (powered by Whova). Please take the time to rate each session you attend!

New Features to SIOF 2018:

- **The “SIOF Select”** designation unites special, featured, Theme Track, Alliance, and Executive Board sessions under one label to highlight sessions cultivated by SIOF volunteers and committees on high demand, high impact topics that are broadly applicable and add value across the membership. What was previously a series of special, featured, Theme Track, Executive Board, and Alliance sessions are now united as SIOF Select!
- **“Methods Mania”** features the highest-rated methods tutorials and sessions in a one-stop location (Sheraton 4) throughout the program
- The **“Reviewer’s Choice”** block (Friday at 1:00) features the highest rated sessions across a diverse array of content areas

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Wednesday

Preregister now for the excellent set of preconference activities—including informative and inspirational workshops and consortia. The Newcomer Reception is from 5-6pm in Sheraton 1, and all are welcome to join us in celebrating the start of the conference at the Welcome Reception from 6–8 pm at the Ballroom Promenade.

Thursday

Opening Plenary: Kick the day off with a must-see opening plenary session. We'll cheer for award winners, be introduced to new Fellows, and hear about progress toward the vision of TeamSIOP from President **Fred Oswald**. The Dunnette Award address will follow the Opening Plenary, and will feature the legendary research and career of Dr. Thomas J. Bouchard.

The Thursday program includes a fantastic five-session Theme Track, "TeamSIOP Ventures Into New Playing Fields," (chaired by **Tracey Rizzuto**) in Sheraton 5. The afternoon includes SIOP Select sessions on solutions for sexual harassment based on lessons from federal agencies, career strategies from recipients of practice award winners, and a global perspective on high performance work practices.

Thursday Evening Networking Reception: Enjoy hors d'oeuvres and network with the top poster winners at 6:00pm in Ballroom Promenade.

Friday

Join the invigorating Frank Landy 5K Fun Run at 7am on Friday, April 20, 2018 adjacent to DuSable Harbor!

Friday's many program highlights include six Friday Seminars on topics including R basics, organizational network analysis, innovations in prehire assessment, unobtrusive data sources, creating dynamic data visualizations through visual notetaking, and cultivating innovation in organizations. These sessions require preregistration and a separate fee from the conference registration, so be sure to sign up first if space permits.

The HR Practitioner Track in Sheraton 3 offers multiple top-rated sessions with applied HR strategies and CE credits. Sessions include lessons learned on structuring talent management functions, the impact of talent on turnover, performance and profit, HR analytic acumen, driving talent conversations with the board, and the influence of technology on human resources management.

SIOP Select sessions include a "learn by doing" machine learning competition, a virtual debate on the future of the field, insights into building a pipeline and sustaining success from winners of science awards, advancing women in I-O, linking I-O work to federal policy and funding opportunities, active aging at work, and translating the value of I-O.

Saturday

Saturday includes fantastic programming that you won't want to miss, so be sure to stay through the close!

SIOP Select sessions include insights from teaching and early career practice award winners on navigating a meaningful I-O career, an interactive session highlighting I-O innovations, promoting robust science in I-O, a conversation with SIOP leadership, and a view on assessment practices around the globe.

4:30: Closing Plenary with keynote address by Mark Squillante, Distinguished Research Staff Member and the Area Head of Stochastic Processes, Optimization and Control within the Mathematical Sciences Department at the IBM Thomas J. Watson Research Center and Director of the Center for Optimization

under Uncertainty Research across IBM Research. His address is titled “Decision Making Under Uncertainty With Applications in Workforce Management.” Mark’s experiences and insights will serve as a fitting way to close a conference focusing on team and multidisciplinary concepts.

6:00: Closing Reception: Reflect on a great conference at a Chicago food- and music-themed reception. This is a reception you won’t want to miss!

I-O Practice Events at the Chicago SIOP Conference and 2018 LEC

Rob Silzer, William Shepherd, Lynn Collins, Mark Morris, and Ben Porr

Your fellow SIOP members have been working very hard to provide numerous SIOP conference programs, courses, and events for I-O practitioners. They have been designing and delivering programs that focus on meeting the needs of SIOP practitioners.

Below are practitioner events that are available to you at the SIOP Conference in Chicago in April and at the Leading Edge Consortium in Baltimore in October. We encourage you to take a close look at them and participate in them. Please forward this information to other members in your professional network who might be interested.

We need your support and engagement: to continue offering and expanding the services and programs that SIOP provides for our practitioners.

1. Individual Leadership Assessment Course

There has been a need in SIOP for more advanced professional development courses for practitioners. The objective of this course is to provide extended professional training and development of practice skills, expertise, and knowledge to those experienced in this specialty.

If you currently provide Individual Leadership Assessments as a psychologist then we encourage you to register for this course. You will learn from the top thinkers in leadership assessment and the course will benefit from your interactivity and leadership assessment experience.

- **Module 1: An Overview for Experienced Assessors** (Morning session only, Chicago, April 18, 2018).
- **Module 2: Interviewing Skills for Leadership Assessment** (Afternoon session only, Chicago, April 18, 2018).

You can register on the SIOP conference website.

For course description see <http://www.siop.org/Conferences/18con/regbk/workshops/ws11.aspx>

For registration see - <http://www.siop.org/conferences/18con/>

2. Early Career Practitioner Consortium (ECPC)

The second annual SIOP Consortium for Early Career Practitioners will be on **Wednesday, April 18, 8 am–5 pm** during the SIOP conference in Chicago. The consortium focuses on the career needs and aspirations of Practitioners who have up to five years of post-degree (PhD. or terminal Masters) work experience. This is a one-day career development experience that includes an overview of employment trends and emerging issues related to developing your career, an assessment of your skills along with a profile and guidance on developing a career plan, and small group mentoring discussions led by experienced I-O psychologist mentors.

This consortium was a sold out success at last year's conference. Participation is limited. Interested SIOP members can register online!

See http://www.siop.org/Conferences/18con/Regbk/practitioner_consortium.aspx

3. Speed Benchmarking

The Professional Practice Committee will be hosting a new event this year at the SIOP conference for mid-career and senior level internal / external Practitioners. More experienced I-O Professionals can network and benchmark with other Subject Matter Experts facing similar challenges. The benchmark topics will include employment surveys, performance management, big data in hiring, legal issues, leadership development, hiring contexts, interviewing, and succession planning. See the SIOP website for greater details.

You will have the opportunity to participate in two 30-minute facilitated benchmarking sessions on key topics. Speed Benchmarking will take place on **Thursday, April 19, 5:00–6:30 PM**. Spots are limited, please reserve your spot and select two benchmarking topics of your choice

See SIOP website <http://www.siop.org/Conferences/18con/regbk/benchmarking.aspx>

4. Speed Mentoring

Back by popular demand, the Professional Practice Committee is again hosting Speed Mentoring. This event is designed for early career professionals. There will be limited seats available for student participants, as well. This event is a terrific opportunity for Practitioners to seek guidance, knowledge, and wisdom from highly seasoned professionals.

Participants will have the opportunity to participate in two 30-minute roundtable topic-driven discussions. Spots for the topic areas are available on a first-come, first-served basis. Speed Mentoring will occur on **Friday, April 20, 5:30-7:00**.

If you would like to participate, please sign up on the SIOP website!
See <http://www.siop.org/Conferences/18con/regbk/mentoring.aspx>

5. Practitioner Reception: A Networking Event

The SIOP Practitioner Reception at last year's annual conference was a huge success, so we are doing it again! The SIOP Professional Practice Committee is hosting the Practitioner Reception—A Networking Event, *presented by Quintela*, on **Thursday, April 19 from 6-7:30 pm in the Sheraton II and III ballrooms**. This event will feature fun activities (e.g., photo booth), Chicago-style food (e.g., deep dish pizza, hot dogs, sausages), and free giveaways (first 100 people to complete the networking challenge will receive a free drink ticket).

Don't miss this great opportunity to network with your practitioner peers!

6. Great I-O Psychology Practice Debate

One of the many practitioner-focused sessions at the annual conference will be the Great I-O Psychology Practice Debate, which will showcase five leading I-O practitioners who will address critical challenges facing I-O practitioners: Are we psychologists? How are PhD level I-O practitioners different from master's graduates and other professionals? The debaters include Rob Silzer, **John Scott, Doug Reynolds, Jeff McHenry, and Erica Desrosiers**.

Over the last 20 years I-O psychologists have gained great influence and have had significant impact in organizations. They are helping organizational leaders be more strategic and make smarter decisions regarding human resources. This has resulted in I-O psychologists being identified as one of the top growth professions for the future. But will this continue?

Please join us for a lively and informative debate on core I-O practice issues

- **Friday, April 20, 2018 from 11:30 AM to 12:50 PM,**
- Room Chicago 6, SIOP Conference, Chicago, Grand Sheraton

See the conference program for other practitioner focused sessions!

2018 Leading Edge Consortium

SIOP will offer another major program for I-O Psychology members and Practitioners in 2018.

The 2018 Leading Edge Consortium will be held **October 19-21, 2018** at the Renaissance Baltimore Harborplace Hotel

High Potentials: Identifying, Developing and Retaining Future Leaders

The Organizing Committee includes cochairs Rob Silzer and Allan Church, and Members John Scott, **Lorraine Stomski, David Baker, and Raphael Prager.**

This will be a significant event for I-O practitioners who assess, identify, develop, evaluate and retain high potential talent. The program will take a talent management approach to HiPos. Look for forthcoming program announcements and information on keynote speakers, workshops and other LEC related events. This will be *a must-attend* event for SIOP members working with HiPos and HiPo programs.

It takes a strong commitment to peers for your colleagues to develop and deliver such a high volume of high quality programming and events. Take advantage of these superlative programs for your ongoing professional development and expand your network at the same time.

Thank you and see you in the Windy City and the Inner Harbor!



SIOP Must-See Sessions & Events for Students

Wednesday April 18th

Chicago CIOP Consulting Challenge Presentations - <http://www.ciop.net/event-2814478> for registration and details

Newcomer Reception for First-Time Attendees

Welcome Reception

Sheraton I

Ballroom Promenade

Starts Monday at noon, Presentations Wednesday at 5:00 PM

5:00 PM

6:00 PM

Special Event

6:00 PM

8:00 PM

Special Event

Thursday April 19th

Opening Plenary Session

Dos and Don'ts: Thriving as PhD, Masters, and Undergraduate Students

SIOP Select: Translating "I-O Speak" in Multidisciplinary Teams

I-O for the Greater Good: Funding your Science with the National Cancer Institute

Careers Poster Session

The Road Not Taken: Career Choices in I-O

Empowering the I-O Internship: How to Maximize Professional Experiences Early

Networking Reception & Top Posters

Chicago VI-X

Streetsville

Sheraton 5

Superior B

Riverwalk

Superior A

Michigan A

Ballroom Promenade

8:30 AM

10:00 AM

Special Event

10:30 AM

11:50 AM

Alternative Session Type

10:30 AM

11:50 AM

Special Event

1:30 PM

2:50 PM

Alternative Session Type

3:30 PM

4:20 PM

Poster

4:00 PM

4:50 PM

Alternative Session Type

5:00 PM

5:50 PM

Alternative Session Type

6:00 PM

8:00 PM

Special Event

Friday April 20th

The Utility and Trustworthiness of I-O Literature: Believe it or Not!

SIOP Select: Building a Pipeline and Sustaining Success as an I-O Scientist

Due for an Upgrade? The Future of I-O Psychology and HR in the Digital Era

Bridging the Academic-Practitioner Divide to Improve I-O Science

Do We Stand? Alternative Methods of Ranking I-O Graduate Programs

The Great I-O Psychology Practice Debates: Addressing Critical Professional Issues

Facilitators and Barriers to Academic Careers for Women in STEM

SIOP Select: Advancing Women in I-O: From Obstacles to Tangible Solutions

Lost in Progression: Transitioning from the Classroom to Practice

School's Out Forever: The Transition from Student to Professional

What I Wish I Knew when I Picked my Career Path: Advice from Midcareer Professionals

SIOP Select: I-O Value (No Longer) Lost in Translation

Speed Mentoring (Preregistration is required)

Erie

Chicago 10

Chicago 8

Erie

Gold Coast

Chicago 6

Riverwalk

Sheraton 1

Superior A

Chicago 9

Michigan B

Wrigleyville

Superior A&B

8:00 AM

9:20 AM

Panel Discussion

10:00 AM

10:50 AM

Special Event

10:00 AM

11:20 AM

Panel Discussion

10:00 AM

11:20 AM

Panel Discussion

11:30 AM

12:50 PM

Alternative Session Type

11:30 AM

12:50 PM

Debate

1:00 PM

1:50 PM

Poster

3:00 PM

3:50 PM

Special Event

3:00 PM

3:50 PM

Roundtable Discussion

4:00 PM

4:50 PM

Panel Discussion

4:00 PM

4:50 PM

Alternative Session Type

5:00 PM

5:50 PM

Special Event

5:30 PM

7:00 PM

Special Event

Saturday April 21th

From Student to Intern: Advice and Networking with Professionals

SIOP Select: Navigating a Meaningful I-O Career: Insights from Award Winners

Lost in Translation: Getting the I-O Science Message Across to HR Practitioners

Tales of Betrayal: Insights from I-O Professionals with Nontraditional Career Paths

Early Career Lessons: Things I Wish I Knew (A Tribute to Chicago Based Movies)

Closing Plenary Session

Closing Reception

Ontario

Chicago 10

Sheraton 1

Superior A

Gold Coast

Chicago VI-X

Chicago VI-X

8:00 AM

9:20 AM

Alternative Session Type

10:00 AM

10:50 AM

Special Event

11:30 AM

12:20 PM

Panel Discussion

11:30 AM

12:40 PM

Panel Discussion

1:30 PM

2:20 PM

Alternative Session Type

4:30 PM

5:30 PM

Special Event

6:00 PM

8:00 PM

Special Event

Schedule subject to change. Last updated 3/8/2018. This resource was prepared by volunteers from the SIOP Education and Training Sub-Committee for Graduate Student Resources. It does not reflect endorsement by SIOP. Full registrants of the conference may attend any of the events below for no additional charge. Guests may attend general conference receptions with an additional fee. More info at www.siop.org/conference.

Advice for Student First-Time Attendees

Before

Set a goal. Are you there to learn, connect, or find a job? Let your answer guide your decisions at SIOP.

Make a priority list of three things (sessions, symposiums, panels, etc) a day that you would like to attend. If you have energy and interest, then attend more. Tips for choosing sessions:

- Look for sessions that are relevant to a current project or paper.
- If you don't have a set research area, attend sessions that interest you as possible specialties.
- Check out SIOP's website for the one-pager highlighting sessions of interest for graduate students.
- Consider the room location and the time you have between sessions if you choose any back-to-back sessions.

Prepare to connect. Bring business cards and update your social media to put your best foot forward. Download the Whova app and sync it to your LinkedIn profile. You can use the app to talk to people who went to the same sessions as you.

Pack accordingly. If you're not staying onsite, consider bringing some items to help you make the most out of the conference.

- A notepad and pens so you can jot down names of presenters to look up or connect with later. Also use these to prepare questions before or during talks so you can actively participate in the conversation
- Consider a business card holder, depending on your goals for the conference. You'll want to make sure you don't lose cards you receive from others.
- A light sweater or other professional outerwear, sometimes conference rooms can be chilly!
- Sandals or other comfortable shoes that fit in your bag, for walking longer distances, if you'll be wearing heels.

Plan to make the most of your time there. Are there places you've been wanting to visit in Chicago? Make a list of local restaurants or tourist spots you can visit and set aside at least a little time.

During

Check out the poster sessions: It'll allow you to speak directly with the researcher(s) and share ideas.

Dress appropriately in professional business attire but not to the point where you'll be uncomfortable all day. Pro tip: Always make sure to break in your shoes ahead of time!

- By the way, we've noticed the first day has more formal wear and clothing becomes slightly more casual throughout the conference while remaining business-style.

Decompress. Take time for yourself; the conference can take a lot of energy out of you. It's ok to take breaks!

Don't forget to eat! Be sure to make it to coffee breaks on time to snag snacks, or you can bring some granola bars in your bag if you're worried about rushing between sessions. You can also bring a reusable water bottle to take advantage of the water coolers around the conference. Also check out the SIOP [receptions](#) for food (and networking).

Remain professional in your attitude and composure, whether it's in a session, an onsite restroom, or the hotel bar. Carry yourself in a professional manner at all times—the I-O field is a small one!

Network, network, network!

- Meet up with alumni from your program or current students of a program you're interested in. These connections could help you gain insight or even get a foot in the door.
- If you go to a session and find someone's research or experience especially interesting, try to meet them afterwards (if they're not busy)! Chances are, they'll appreciate your interest.
- Sport the "first time attendee" ribbon to spark conversations.
- When you get a business card, write about the questions you have for the person, how you met, and so on to help you keep track of who is who.
- Attend social hours coordinated by SIOP or other sponsors that share the same interests as you.

Have fun! It's your first SIOP experience, so soak it all in while you can, without putting too much pressure on yourself—you'll likely be back!

After: Within 1 week

Revisit goals. Did you meet the goals you set for yourself prior to the conference? What else might you need to do as follow-up in order to reach all of your goals?

Revisit notes and organize them in a way that helps you reference them for later projects or professional development.

Follow-up with a brief email or LinkedIn connection to everyone with whom you exchanged cards or had a more extensive conversation. Thank them for the opportunity to chat, mention anything memorable you learned from them, and/or provide anything you promised as a follow-up.

Organize and submit travel-related receipts, if you get any reimbursements from your department.

Write a summary of the top three things you learned from SIOP 2018. Share it with your advisor, research teams, and whoever else might be interested or benefit from it. Ask them what they learned too!

Members in the Media

Barb Ruland

More people are becoming aware of I-O psychology's relevance and business benefits. Many SIOP members are helping raise the profession's visibility, and these are the media mentions we found from November 27, 2017 through January 31, 2018.

We scan the media on a regular basis but don't catch everything. So, please feel free to [send us your media mentions](#). We amplify them on social media and share them in this column. Use the column to look for project collaborators, spark ideas for research programs, and keep up with your colleagues.

The Profession of I-O Psychology

Mentions of the profession in general educational publications is one sign of I-O psychology's growing visibility. The [video](#) featuring **Beth Payton** from Ohio's Broadcast Educational Media Commission can be a great resource for outreach to schools. Love the bowtie the HR manager wears in the video and the fact primary and middle school students are being taught about the field!

SIOP offers a wealth of resources to help with I-O psychology outreach and education efforts, including [brochures](#), an [overview video](#), and the [interactive career paths tool](#).

Although a Swedish website lists I-O as one of "[the 5 Best Jobs You've Never Heard Of](#)," word about the profession is getting out. [EHS Daily Advisor](#), a publication for environmental health and safety professionals noted that I-O psychologists enjoyed some of the highest salary growth during their most recent reporting period. *US News & World Report* also lists it as one of the "[25 Best Jobs That Pay 100k](#)."

I-O psychology's rising star is fueled by broadly useful, specifically applicable insights. As [one writer for Inc.](#) said, "the business world is turning to social scientists to really help them understand why and how people tick. It should come as no surprise that industrial organizational psychology is one of the fastest growing professions."

A couple examples support the idea that the ability to understand human behavior through data analysis is key to I-O's business value: Community officials in Urbana, IL, drew on I-O psychology methods to help create a successful proposal for a [community policing program](#), and the trustees of the [University of New Mexico](#) selected SIOP member **Garnett Stokes** to apply her expertise as president of their institution.

Gender and Diversity Issues

The sexual harassment scandals that rocked the country and spawned the #metoo movement brought many to seek insights from SIOP's members. **Rebecca Bennett** contributed to a discussion of gendered interactions in the workplace posted in the Free Library's [Journal of Managerial Issues](#).

Lisa Scherer discussed what can cause [sexual harassment training](#) to backfire. **Amy Cooper Hakim** predicted that there will be an [uptick in workplace training](#) to "ensure that all members of an organization treat each other with respect."

Caren Goldberg contributed I-O psychology insights to several articles on the subject for [The Parallax](#), [Bustle](#), and [Elite Daily](#). **Vicki Magley** also fielded several requests for expert insight, including [NPR's Marketplace](#), [Scientific American](#), [Wired](#), [Business Insider](#), and the [New York Times](#).

Jaclyn Jensen advocated for [#SponsorHer](#) over #MentorHer for helping to solve sexual harassment in the workplace in the editorial for Women's eNews. [Industrial Health and Safety News](#) picked up SIOP's article, "[How Organizations Can Really Fight Sexual Harassment](#)."

Research conducted by **Mikki Hebl** and **Christine Nittrouer** on gender disparities in colloquium invitations, published in the [Proceedings of the National Academy of Sciences](#), was highlighted in a publication for those in higher education.

I-O Activism

Two student members, **Alise Dabdoub** and **Samantha Elliott**, got early career experience with advocacy work and media coverage in the [Oklahoma University student paper](#) by organizing a protest against the proposed tax increases for universities.

Rice University's news service highlighted [big data's power for good](#) in the school's response to Tropical Storm Harvey as the introduction to a piece about the school's new data science minor, cochaired by **Fred Oswald**.

Career Advice From and For I-Os

SIOP members were quoted in business and general publications on a wide variety of career development topics.

A *Wall Street Journal* article on making good on a new job that's a bad fit drew on research by **Allison Ellis**, **Talya Bauer**, and **Berrin Erdogan** about how new employee behavior influences organizational support they receive.

Amy DuVernet and **Tiffany Poeppelman** discussed how and why [finding a mentor](#) is good for training professionals.

Kristin Shockley discussed the career drawbacks of [remote work](#) and offered several tips for mitigating them.

Ben Dattner's list of things you should never say to your boss was covered by [Business Insider](#) and [Long Room](#). He also reminded readers of a roundup article for *Money* about [getting along at work](#), that liking everybody isn't required for organizational success.

Allan H. Church cowrote a *Harvard Business Review* "Managing Up" article advising how to recognize and improve a situation with [a boss who doesn't like you](#). **Adam Grant** urged managers to [express gratitude](#) for the workers' efforts.

Members also had suggestions for those in the job market. Amy Cooper Hakim offered job seekers advice for [connecting with interviewers](#). **Lauren Salomon** discussed [impression management](#) in a Business Insider article that also cited [research](#) by **Marie Waung** and **Jeff DiMambro**.

Popular Press Topics

Adam Grant was cited in a blog post about how to [beat procrastination](#), another on how to [model resilience](#) for children, and one about [explaining love](#) to them. **Ron Riggio** contributed to a widely shared

roundup article on [morality and tribe mentality](#) for *USA Today*. He also helped explain why Matt Lauer looks different to people in the wake of his [sexual harassment charges](#).

Employee Recruiting and Selection, Personality

Ken Yusko's presentation on the use of psychological assessments to provide a winning advantage in [selection for sports teams](#) was highlighted in a *Forbes* article. An industry publication for the wood processing, pallet, and sawmill industry quoted Ben Dattner on [employment testing](#).

[Facebook's People VP](#) uses a term, "disagreeable givers," Adam Grant coined in *Givers and Takers* to describe one of the qualities the organization seeks in its hiring process.

Employee Engagement, Motivation, and Turnover

A Salesforce blog post quoted Grant on how to support [resilience](#), after he gave a presentation at the company. **Christine Allen** argued that the competitive [business advantage of resilience](#) justifies the organizational and personal investment required to build it, and offered tips for doing so.

Paul Baard covered [communication](#); different [types of motivational drive](#); how organizational culture translates to [the bottom line](#); and what to do [when motivation takes a hit](#) in his column, "Motivation Matters."

Jennifer Cullen wrote for the *Harvard Business Review* about flaws in [employee engagement survey questions](#) that can lead organizations astray.

Employee Burnout, Work-Life Balance

Allison Gabriel made a bottom line argument for taking care of human resources while talking about the need to [prevent burnout](#) in a piece for KJZZ public radio.

How can rituals help you unhook from work at the end of the day? SIOP member **Teresa Amabile's** research was highlighted in this article about [how to leave work at work](#).

Leadership, Management, and Organizational Culture

Allan H. Church coauthored an advice column for leaders on working with [underachieving team members](#), highlighting different strategies for different types of performance issues. Ben Dattner urged leaders to [address failures](#) honestly and in plain language; whereas Adam Grant urged them to express [gratitude for workers' efforts](#).

Alison Eyring said the real key to [successful change management](#) is "enabling and supporting people to adapt." **Karl Weick** is quoted in a [Motley Fool podcast](#) on the need for modern leaders to pay more attention to compass points than maps, metaphorically speaking.

Tomas Chamorro-Premuzic collaborated on an article detailing the organizational dynamics that impede [high potential programs](#).

Don't forget to include SIOP on your [mailing list](#) for notices of media mentions and professional accomplishments.

**Introducing SIOP's
Committee for the Advancement of Professional Ethics (CAPE)**

Deirdre Knapp and Joel Lefkowitz

In April 2017, SIOP's executive board approved formation of a Committee for the Advancement of Professional Ethics (CAPE). In addition to Deirdre Knapp as Chair, the initial committee members—representing practice, research and/or academic areas—are **Joe Allen, George Banks, James Grand, Paul Green, Amy Grubb**, and Joel Lefkowitz. **Rodney Lowman** is involved in an advisory capacity, but his primary role will be serving on the recently announced APA Ethics Code Revision Task Force (ECTF).

For a long time, it probably would have been fair to say that the view of research ethics held by many SIOP members was “an unreasonable set of rules or expectations designed by intrusive idealists to make our lives more difficult” (Lefkowitz, 2017, p. 1.) and that ethics education, when it was taught at all, was taught in ways that communicated, “This is something we unfortunately must require you to do, so let's get it over with as quickly as we can, and then we can move on to the important things” (Macrina, 2014, p. xviii). But the *zeitgeist* has changed. We believe that the board's action recognizes the increasing relevance and greater salience of ethical issues in the field and among SIOP members in their work as consultants, researchers, and educators (cf. Payne, Morgan and Allen, 2015; Steiner & Yancey, 2013).

CAPE's agenda is to:

- Develop and/or share resources targeted to I-O graduate education in ethical research and practice
- Develop and/or share resources targeted to I-O continuing professional education in ethical matters, including promoting inclusion of ethics-related programming at the annual conference, inclusion of ethical decision-making thought pieces (e.g., case studies) in SIOP communications (e.g., *Newsbriefs*, website, *TIP*), and self-study resources
- Consult with the Executive Board on relevant SIOP policies (e.g., conflict of interest)
- Serve as a source of input and response team to proposed changes to ethics-related standards (e.g., the APA ethics code)

To be clear, the need for this new committee is not borne out of a concern that there are too many I-O psychologists behaving badly. Rather, it reflects the reality that we all routinely make professional decisions that, explicitly or not, reflect ethical choices. Helping I-O psychologists more explicitly recognize and navigate situations requiring such choices can only make us stronger as a profession. Raising the profile of discourse related to ethics and promoting mindful consideration of ethical matters in professional decision-making as I-O psychologists is the goal of this new committee. We also hope to encourage the development of and raise the profile of a new generation of I-O practitioners and scholars who are thought leaders in this area.

At the time of this writing, the committee has met (by teleconference) only once, and we are in the process of developing an agenda to implement our objectives. To that end, we would very much like to hear from you—with your suggestions for implementation, and/or to volunteer your involvement in the committee's activities. You may do this by reaching out to any member of CAPE.

We will be publicizing the existence of the committee and soliciting member involvement in multiple forums and during the SIOP conference (through ad hoc means; the official program has been finalized). So look for announcements from CAPE. See you in Chicago!

References

- Lefkowitz, J. (2017). *Ethics and values in industrial-organizational psychology*, 2nd Ed. New York, NY: Routledge; Taylor & Francis Group.
- Macrina, F.L. (2014). *Scientific integrity: Text and cases in responsible conduct of research*, 4th Ed. Washington, DC: ASM Press.
- Payne, S.C., Morgan, W.B. & Allen, J. (2015). Revising SIOP's guidelines for education and training: Graduate program director survey results. *The Industrial-Organizational psychologist*, 53(2), 158-161.
- Steiner, A. & Yancey, G.B. (2013). The knowledge and skills employers desire when hiring an I-O psychologist. *The Industrial-Organizational Psychologist*, 51(1), 53-60.

Foundation Spotlight: Are There Too Many Awards?

Milton D. Hakel, PhD

What is the best number of awards for SIOP to present?

It seems like a simple question. How many are there? Would you believe 21?

Ok, here's the list: The Dunnette Prize leads off, because it is the biggest (\$50,000) and has just been presented for the second time, this year to Thomas Bouchard, and in 2015 to **Frank Schmidt**.

There are seven Distinguished and Career Awards: [Distinguished Professional Contributions Award](#), [Distinguished Scientific Contributions Award](#), [Distinguished Service Contributions Award](#), [Distinguished Early Career Contributions—Practice Award](#), [Distinguished Early Career Contributions—Science Award](#), [Distinguished Teaching Contributions Award](#), and the newest, the [SIOP Humanitarian Award](#).

Then there is a growing collection of eight Achievement and Best Paper Awards: [William A. Owens Scholarly Achievement Award](#), [M. Scott Myers Award for Applied Research in the Workplace](#), [Raymond A. Katzell Award in I-O Psychology](#), [Joyce and Robert Hogan Award for Personality and Work Performance](#), [Wiley Award for Excellence in Survey Research](#), [Jeanneret Award for Excellence in the Study of Individual or Group Assessment](#), [S. Rains Wallace Dissertation Award](#), and the [Schmidt-Hunter Meta-Analysis Award](#).

I suppose that the five kinds of Conference Awards should also be counted: [Best Lesbian/Gay/Bisexual/Transgender \(LGBT\) Research Award](#), SIOP Best International Paper Award, Robert J. Wherry Award for Best Paper at IOOB Conference, [John C. Flanagan Award for Best Student Contribution at SIOP](#), and the [SIOP Student Travel Award](#).

Ah, but SIOP also awards the Leslie W. Joyce and Paul W. Thayer Graduate Fellowship, as well as five+ named scholarships ([Lee Hakel Graduate Student Scholarship](#), [Mary L. Tenopyr Graduate Student Scholarship](#), and [SIOP Graduate Student Scholarships](#), [George C. Thornton, III Graduate Scholarship](#), [Irwin L. Goldstein and Benjamin Schneider Graduate Scholarships by the Macey Fund](#))...

...Plus seven research grants, namely [Douglas W. Bray and Ann Howard Research Grant](#), [Sidney A. Fine Grant for Research on Job Analysis](#), [SIOP Small Grant Program](#), [SIOP International Research and Collaboration \(IRC\) Small Grant](#), [Adverse Impact Reduction Research Initiative and Action \(AIRRIA\) Grant](#), [James L. Outtz Grant for Student Research on Diversity](#), and [Hebl Grant for Reducing Gender Inequities in the Workplace](#). New for 2019 will be the Graen Grants for Student Research on Design Thinking and New Professionals.

And the [Human Resource Management Impact Awards](#) program, a joint venture of SHRM and SIOP and their foundations needs to be counted.

So, 36 and counting is the best current answer to the “how many are there?” question.

Too many? Not enough? Stimulated by proposals for additional awards, the questions arose during the SIOP Executive Board meeting in January. They are now being considered by the Awards Strategy Task Force. **Fred Oswald** and I have appointed **Leaetta Hough** (chair), **Paul Green** (vice chair), **Lillian Eby**,

Tara Behrend, Betsy Shoenfelt, Tiffany Poeppelman, and John Scott to advise both the SIOP Executive Board and the SIOP Foundation Trustees concerning the awards program. They are considering questions such as why have awards at all? What are the purposes for giving them? What is meant by “award”? Are grants and scholarships included? Is there an optimal number and distribution of awards? How big or small should awards be? What factors make awards desirable? Many subsidiary questions are also being considered.

The Awards Strategy Task Force is now deliberating, and welcomes any comments and questions you may provide—write to AwdsStratTF@siop.org. Please note that the SIOP Foundation is a separate corporation, made necessary by IRS rules for public charities to distinguish it from other nonprofits, such as trade associations (e.g., SIOP). The Task Force will report its recommendations in September.

Thanks in advance for your input.

Milt Hakel, President, mhakel@bgsu.edu
Rich Klimoski, Vice-President, rklimosk@gmu.edu
Nancy Tippins, Secretary, Nancy.Tippins@tippinsgroup.com
Leaetta Hough, Treasurer, leaetta@msn.com
Adrienne Colella, Communications Officer, acolella@tulane.edu
Mirian Graddick-Weir, Trustee, mirian_graddick-weir@merck.com
Bill Macey, Trustee, wmacey9@gmail.com
John C Scott, Trustee, JScott@APTMetrics.com

SIOP Awards Opening Soon!

**Cindy McCauley, Chair
Awards Committee**

The call for nominations for SIOP and SIOP Foundation awards, scholarships, and research grants opens at the annual conference. Don't miss this opportunity to submit your research project for an award or grant, apply for scholarship funding to help with the expense of carrying out your dissertation research, or nominate a deserving colleague for one of SIOP's Distinguished Awards!

Below is a list of the available awards, scholarships, research grants, and the Joyce and Thayer fellowship. For detailed information on the criteria and documentation required, and to submit your nomination or application please click [here](#).

Distinguished and Career Awards

- Distinguished Professional Contributions Award
- Distinguished Scientific Contributions Award
- Distinguished Service Contributions Award
- Distinguished Early Career Contributions—Practice Award
- Distinguished Early Career Contributions—Science Award
- Distinguished Teaching Contributions Award
- SIOP Humanitarian Award

Achievement Awards & Best Paper Awards

- William A. Owens Scholarly Achievement Award
- M. Scott Myers Award for Applied Research in the Workplace
- Raymond A. Katzell Award in I-O Psychology
- Joyce and Robert Hogan Award for Personality and Work Performance
- Wiley Award for Excellence in Survey Research
- Jeanneret Award for Excellence in the Study of Individual or Group Assessment
- S. Rains Wallace Dissertation Award
- Schmidt-Hunter Meta-Analysis Award

Research Grants

- Douglas W. Bray and Ann Howard Research Grant
- Sidney Fine Grant for Research on Job Analysis
- SIOP Small Grant Program
- SIOP International Research and Collaboration (IRC) Small Grant
- Adverse Impact Reduction Research Initiative and Action (AIRRIA) Grant
- James L. Outtz Grant for Student Research on Diversity
- Hebl Grant for Reducing Gender Inequities in the Workplace

- Graen Grant for Student Research on the Development of New Professional Knowledge Workers – ***New in 2019***

Scholarships and Fellowship

- Leslie W. Joyce and Paul W. Thayer Graduate Fellowship
- Lee Hakel Graduate Student Scholarship, Mary L. Tenopyr Graduate Scholarship, and Graduate Student Scholarships
- George C. Thornton, III Graduate Scholarship
- Irwin L. Goldstein or Benjamin Schneider Graduate Scholarships by the Macey Fund

The deadline for applications is June 30, 2018. We look forward to reviewing your applications. Please email me at mccauley@ccl.org, if you have any questions.

SIOP UN Committee: Help us Identify How I-O Psychology Informs the Sustainable Development Goals
Julie Olson-Buchanan, Jenna Van Fossen, Kalaani Young, Kyle Lyman, Samuel Nunez, Zayna Osborne,
Sabrina Wilson, & Emily Chavez
California State University, Fresno

SIOP UN Committee: Mathian Osicki, Julie Olson-Buchanan, Lise Saari, Nabila Sheikh, John Scott, Lori Foster, Deborah Rupp, Mary O'Neill Berry, Walter Reichman, Dan Maday, Aimee Lace

Are you interested in using I-O psychology to make a difference in the world? Do you find SIOP's work with the United Nations intriguing and are looking for a way to get involved? If so, the SIOP UN team invites you to consider working on a new initiative to identify how the science and practice of I-O psychology can inform work on the 17 United Nations Sustainable Development Goals (SDGs). The 17 United Nations SDGs are a "universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity" (United Nations Development Programme, n.d.) and includes such goals as eradicating poverty and hunger and ensuring health/well-being and quality education, among others.

As an NGO with special consultative status to the United Nations, SIOP is called on to respond to this rallying call through our expertise in I-O psychology. However, our field does not traditionally categorize our research and practice in terms of the areas identified in the SDGs and, as such, the SIOP UN Team has worked on translating how our field might align with and support the SDGs.

To aid in this effort, we are launching a new initiative. Specifically, we are interested in the creation of annotated bibliographies for each of the 17 SDGs. Such bibliographies will enable SIOP to be better prepared to weigh in on position papers (for which we often have only a few days to respond) and aid in the identification of I-O psychology expertise and best practices as it relates to a particular SDG. In addition, we believe it will facilitate the growth of our field in the direction of humanitarian work psychology by identifying gaps in the literature and stimulating additional research in I-O psychology that serves or supports the United Nations mandate.

In the remainder of the article, we describe the process and preliminary findings for the first annotated bibliography we developed. It focuses on SDG #2, which is to "end hunger, achieve food security, and improved nutrition, and promote sustainable agriculture" (United Nations Development Programme, n.d.).

Process Used for Pilot Annotated Bibliography

Form Workgroup

There are a number of existing workgroups (e.g., research labs, work colleagues) that would work well for this initiative, or you can form a new one for this purpose. We formed a group with seven undergraduates and the first author at California State University, Fresno. The undergraduates included Psychology and Business majors, all of whom had taken an Introduction to I-O Psychology course and had an interest in the field. However, the possibilities for forming groups are wide-open and can be a great way to team build within a local I-O group, work colleagues in different disciplines, or graduate students.

Select SDG

We selected the 2nd SDG because hunger is a critical concern in our region. Other groups might select an SDG that resonates with them or is most closely linked with their areas of practice or research. To select an SDG, please see a list of the 17 SDGs, which are available on the SIOP United Nations

(<http://www.siop.org/Prosocial/UN.aspx>) page, and inform Julie Olson-Buchanan (julieo@csu-fresno.edu) of your plans to ensure that groups do not duplicate efforts.

Brainstorm

At first blush, it is hard to see the link between our research and practice and such goals as eradicating hunger. This is where brainstorming in the group is key. Some prompts that helped us identify potential literature included “why would or should organizations/employees care about this issue?” and “how might something I-O psychology does well relate to a solution for this societal issue?”

Search for Literature and Complete Initial Annotated Bibliography Entries

After brainstorming some ideas, we divided up the areas and individuals searched the literature (including journals and conference papers) in traditional I-O psychology areas as well as related fields, and examined write-ups of relevant projects in organizations. It is important to take a broad approach here, within psychology and related fields, particularly given that there is (generally) limited research available. To keep the annotations consistent, we used a template that included the following components: (a) Description and summary of the study’s or project’s purpose and approach (method), (b) summary of main conclusions, (c) source’s link to the SDG, and (d) Future research suggestions.

Revise and Brainstorm Structure of the Annotation

By posting the annotated bibliographies on a shared drive, we were able to revise and modify the annotated bibliographies. A key part of the process included meeting again to discuss the findings and brainstorm additional directions to search.

General Findings

Regular, secure access to nutritious food is a key component to improving current and future conditions for our society, particularly with respect to the development of a global workforce. As noted by the Food and Agriculture Organization of the United Nations (2015) “Hunger and undernutrition mean less-productive individuals, who are more prone to disease and thus often unable to earn more and improve their livelihoods. This, in turn, hinders progress in alleviating extreme poverty and fighting hunger—particularly as labor is the principal asset held by the poor” (p. 27). As such, our workgroup identified two general areas of I-O research and practice that can serve to inform the United Nations Mandate relating to SDG 2. This includes the literature relating to how food security and nutrition is a critical factor for the internal functioning and well-being of organizations and the CSR literature and related publications on private organizations’ efforts to address hunger issues.

Food insecurity and nutrition directly affect worker and organizational well-being. Consider, for example, the high number of food insecure workers in a developed country, such as the United States. According to a 2017 USDA report, 12.3% of U.S. households (or 1 in 8) qualified as food insecure. A 2009 report found that 68% percent of households with food-insecure children had at least one adult working full-time, and 78% had at least one adult working full or part time (United States Department of Agriculture Economic Research Service, 2009). Fifty-four percent of households that utilize Feeding America food banks have at least one member who has worked in the past year, and 20% had members employed throughout the year (Babic et al., 2015). As such, there appears to be a significant number of workers suffering from food insecurity. Moreover, a healthy diet is more expensive than an unhealthy

one, at a difference of \$1.15 to \$1.94 per day (cf. Rao, Afshin, Singh, & Mozaffarian, 2013, for a review). Research indicates that in households that experience food insecurity, adults tend to sacrifice quality and quantity of food, saving food for children (Coates, et al., 2006) in part because existing food programs for children do not appear to be sufficient (Pickett, Michaelson & Davison, 2015). Although the percentage of workers in developing and developed countries varies around the world (cf. Food and Agriculture Organization of the United Nations, 2015), it is clear that hunger is a significant problem for a sizable number of adults who are in the workforce, as well as for those who are not in the workforce.

Consequences of food insecurity in the workplace include outcomes associated with sleeplessness, worry, guilt, alienation, and psychological strain (Coates et al., 2016). Working hours are a particularly critical time for eating and nutrition (Castellari & Berning, 2016). Yet, some of the most food insecure adults have limited access to healthy, affordable food while at work, underscoring the need for healthy, inexpensive (or free) food at or near the workplace for a significant portion of lower wage earners. Indeed, although research on adults in the work context is limited, healthy eating is related to several positive outcomes including affect (White, Horvath & Conner, 2013) and performance (Edwards, Mauch & Winkelman, 2011).

Organizations may engage in corporate social responsibility (CSR) efforts that are designed to address hunger or nutrition in their local or global community, such as manufacturers donating overproduction to food banks, raising funds for hunger relief, or workers volunteering at food pantries as part of an outreach effort. One particularly compelling example is ConAgra's five prong strategic initiative to improve children's food security in the United States (Knowlton, Phillip, & Knowlton, 2012). Research has identified several positive outcomes of CSR efforts for participating organizations, such as affective commitment (Mueller, Hattrup, Spiees, & Lin-Hi, 2012), prosocial behavior (Thornton & Rupp, 2016), employee recruitment (Catano & Hines, 2016), and positive consumer perceptions (Du, Bhattacharya & Sanker, 2010). Yet, it is important to consider the context for CSR initiatives, as there is some evidence that consumer perceptions of CSR in developing countries may not share the same outcomes (Arli & Lasmono, 2010), and CSR initiatives that are imposed upon developing countries may lead to complicating issues within an area of need (Khan, Westwood, & Boje, 2010).

Organizations can also contribute to humanitarian efforts and societal well-being by sharing their expertise. For example, a number of studies in related fields have examined how business expertise in logistics (Kovacs & Spens, 2007) can improve access to food for those affected by disaster (Van Wassenhove, 2006). The common theme of such research is that the viability of such private sector-humanitarian partnerships center on making a compelling case for the consequences of CSR, an area in which I-O psychology has considerable expertise (e.g., Knowlton & Phillips, 2012; Thornton & Rupp, 2016).

Future Research Areas

We identified a number of important areas for future research. In particular, there is little research on food insecurity and its effects on job performance and health of workers in developed countries, and virtually no research on these variables in developing countries. Interventions in the workplace, such as access to inexpensive, healthy food should be examined, particularly with respect to key outcome variables such as safety, health, and performance. Relatedly, the relation between food insecurity and employment-readiness has not been examined, an issue that might relate to a cycle of poverty and has implications for available labor pools. There is a substantial amount of research on the antecedents and consequences of CSR. Another area for future research in this area could include how the findings of CSR

research in I-O psychology can be used to facilitate the creation and expansion of private sector–humanitarian partnerships.

Conclusion

We found our work on the annotated bibliography to be very informative and will hopefully serve as a model for the additional work needed to cover the remaining SDGs. It helped us see I-O psychology through a different lens and made us better appreciate how I-O research and practice can be translated to address and inform actions needed to accomplish the SDGs. The annotated bibliographies will be stored on a shared drive for the United Nations team and will be critical resources for informing SIOP position papers as well as SIOP’s weighing in on policy making, and special projects that serve the United Nations mandate. If you are interested in creating an annotated bibliography on another SDG for the UN, please contact Julie Olson-Buchanan at julieo@csufresno.edu. We look forward to expanding our partnerships within SIOP to help make a difference in the world through I-O psychology.

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Call for Nominations

Nominate the Next *Professional Practice Series* Editor

SIOP is now soliciting nominations for the position of editor of the Professional Practice Series. The new series editor will be selected by the Publications Board and approved by the Executive Board. The selected series editor will begin working with Incumbent Editor **Nancy Tippins**, beginning **December 2018**, and assumes duty beginning **April 1, 2019**.

The series editor must be a SIOP Fellow or Member. Any SIOP Fellow or Member can nominate individuals for the editorship. Self-nominations are also welcome.

Professional Practice Series Description

The series is designed to provide industrial-organizational psychologists, organizational scientists and practitioners, human resource professionals, managers, executives, and those interested in organizational behavior and performance with volumes that are insightful, current, informative, and relevant to best organizational practice. The series volumes are guided by five tenets designed to enhance future organizational practice:

1. Focus on practice, but grounded in science.
2. Translate organizational science into practice by generating guidelines, principles, and lessons learned that can shape and guide practice.
3. Showcase the application of industrial-organizational psychology to solve problems.
4. Document and demonstrate best industrial and organizational practices.
5. Stimulate research needed to guide future organizational practice.

The series volumes seek to inform those interested in practice with guidance, insights, and advice on how to apply the concepts, findings, methods, and tools derived from research in industrial-organizational psychology to solve organizational and human resource related problems.

Each volume is focused on one important theme or element of I-O practice and is usually composed of 10–15 separately authored chapters related to the overall theme of the volume. The chapter authors are solicited and selected by the volume editor(s) in consultation with the series editor and the series editorial board. The final selection of authors and the editorial quality of the chapters is the responsibility of the volume editor(s) who may seek consultation with the series editor as they see fit. The intent is to publish approximately one new volume each year.

Position Description

The series editor is appointed to a 5-year term and is responsible for managing the production of series volumes, including identifying and soliciting volume editors and ideas, and assisting volume editors with identifying chapter authors and ensuring chapter quality, as needed. The series editor is assisted by a series editorial board, which is assembled by the series editor in consultation with the SIOP Publication Board.

Requirements for Series Editor

It is highly desirable that series editors be experienced practitioners. Practitioners would include I-O psychologists in academic or applied research organization positions for whom applied practice is a substantial component of their position. That is, university faculty who devote virtually all of their time to teaching, research, and service would typically not be recruited as a series editor, unless their academic appointment was recent and they had substantial practice experience in a previous position. Beyond being expert in particular areas of practice, the series editor should also have a broad perspective of I-O psychology, including both its scientific base and the full spectrum of applications.

Information for Nominees

On average the series editor devotes approximately half a day per week to his/her editorial responsibilities, although the actual time spent in any given week is highly variable.

The most time-intensive aspects of the series editor position are the identification and recruitment of the individual volume editors and the identification and recruitment of the appropriate chapter authors. Potential volume editors can be solicited and recruited in many ways (e.g. issuing a call for ideas and proposals for a volume), and it is the series editor's responsibility to use all available means. The editorial quality of a specific volume is the primary responsibility of the volume editor, with advice and consultation from the series editor.

Other demands include helping to advertise and market the series (e.g. suggesting advertising copy) and meeting with editorial board members and volume editors at SIOP, or at other conferences.

Nomination and Application Information

If you are interested in serving as series editor, or if you know someone who might, submit your nomination via email by August 24, 2018 to **Mark Poteet** (mlpoteet@verizon.net). Nominations need only be a brief letter announcing the intention to nominate. Only those individuals nominated by this date will be able to submit application materials.

All nominated individuals should submit their application package by September 28, 2018 to Mark Poteet (mlpoteet@verizon.net). Each application package should include electronic versions of a current CV, a statement that describes the nominee's vision for the Professional Practice Series, and three letters of recommendation from SIOP Fellows or Members.

SIOP Publications Board

Mark Poteet (Professional Practice Series Editor Selection Committee Chair)

Richard Klimoski

Steve Kozlowski

Ron Landis

Neal Schmitt

Nancy Tippins

Mo Wang

Call for Nominations

Nominate the Next *Organizational Frontiers Series* Editor

SIOP is now soliciting nominations for the position of editor of the Organizational Frontiers Series. The editor will be selected by the Publications Board, and approved by the SIOP Executive Board. The selected series editor will begin working with Incumbent Editor **Rich Klimoski**, beginning **December 2018**, and will assume duty beginning **April 1, 2019**.

The series editor must be a SIOP Fellow or Member. Any SIOP Fellow or Member can nominate individuals for the editorship. Self-nominations are also welcome.

Organizational Frontiers Series Description

Launched in 1983 to make scientific contributions to the field, this series publishes books on cutting-edge theory and research derived from practice in organizational and industrial psychology, and related disciplines. The goal of the series is to inform and stimulate research for SIOP members (students, practitioners, and researchers) and people in related disciplines including other subdisciplines of psychology, organizational behavior, human resource management, and labor and industrial relations. The series is designed to provide industrial-organizational psychologists, organizational scientists and practitioners, human resource professionals, managers, executives, and those interested in organizational behavior and performance with volumes that are insightful, current, informative, and relevant in the conduct of research and practice in the organizational sciences.

Each volume is focused on one important theme or element of I-O research and is usually composed of 10–15 separately authored chapters related to the overall theme of the volume. The chapter authors are solicited and selected by the volume editor(s) in consultation with the series editor and the series editorial board. The final selection of authors and the editorial quality of the chapters is the responsibility of the volume editor(s) who may seek consultation with the series editor as they see fit. The intent is to publish approximately one new volume each year.

Position Description

The series editor is appointed to a 5-year term and is responsible for managing the production of Series volumes, including identifying and soliciting volume editors and ideas, and assisting volume editors with identifying chapter authors and ensuring chapter quality, as needed. The series editor is assisted by a series editorial board, which is assembled by the series editor in consultation with the SIOP Publication Board.

Requirements for Series Editor

It is highly desirable that series editors be experienced researchers who work in academic or applied research positions for whom the conduct and application of research in the organizational sciences is a substantial component of their position. The series editor should also have a broad perspective of I-O psychology, including both its scientific base and the full spectrum of applications.

Information for Nominees

On average the series editor devotes approximately half a day per week to his/her editorial responsibilities, although the actual time spent in any given week is highly variable.

The most time-intensive aspects of the series editor position are the identification and recruitment of the individual volume editors and the identification and recruitment of the appropriate chapter authors. Potential volume editors can be solicited and recruited in many ways (e.g. issuing a call for ideas and proposals for a volume), and it is the series editor's responsibility to use all available means. The editorial quality of a specific volume is the primary responsibility of the volume editor, with advice and consultation from the series editor.

Other demands include helping to advertise and market the Series (e.g. suggesting advertising copy) and meeting with editorial board members and volume editors at SIOP, or at other conferences.

Nomination and Application Information

If you are interested in serving as series editor, or if you know someone who might, submit your nomination via email by August 24, 2018 to **Neal Schmitt** (schmitt@msu.edu). Nominations need only be a brief letter announcing the intention to apply. Only those individuals nominated by this date will be able to submit application materials.

All nominated individuals should submit their application package by September 28, 2018 to Neal Schmitt (schmitt@msu.edu). Each application package should include electronic versions of a current CV, a statement that describes the nominee's vision for the Organizational Frontiers Series, and three letters of recommendation from SIOP Fellows or Members.

SIOP Publications Board

Neal Schmitt (Series Editor Selection Committee Chair)

Richard Klimoski

Steve Kozlowski

Ron Landis

Mark Poteet

Nancy Tippins

Mo Wang

CONFERENCES AND MEETINGS

Please submit additional entries to **Marianna Horn** at mhorn@apmetrics.com.

2018

- April 12–16 Annual Convention, National Council on Measurement in Education. San New York, NY. Contact: NCME, <http://www.ncme.org/ncme/NCME/>
- April 13-17 Annual Convention, American Educational Research Association. New York, NY. Contact: AERA, www.aera.net.
- April 19-21 Annual Conference of the Society for Industrial and Organizational Psychology. Chicago, IL. Contact: SIOP, www.siop.org. (CE credit offered.)
- April 22-25 HRPS Global Conference. Scottsdale, AZ. Contact: HRPS, www.hrps.org.
- May 6-9 Annual Conference of the Association for Talent Development. San Diego, CA. Contact: ATD, <http://www.atdconference.org/>
- May 24-27 Annual Convention of the Association for Psychological Science. San Francisco, CA. Contact: APS, www.psychologicalscience.org. (CE credit offered.)
- July 28-August 2 Joint Statistical Meetings. Vancouver, BC, Canada. Contact: American Statistical Association, www.amstat.org (CE credit offered.)
- August 9-12 Annual Convention of the American Psychological Association. San Francisco, CA. Contact: APA, www.apa.org (CE credit offered.)
- August 10-14 Annual Meeting of the Academy of Management (AoM). Chicago, IL. Contact: AoM, <http://aom.org/>.
- October 1-5 Annual Meeting of the Human Factors and Ergonomics Society. Philadelphia, PA. Contact: The Human Factors and Ergonomics Society, www.hfes.org. (CE credit offered.)
- Oct 19-20 14th Annual Leading Edge Consortium. Baltimore, MD. Contact: Society for Industrial and Organizational Psychology, www.siop.org/lec/2018. (CE credit offered.)
- Oct 28-Nov 3 Annual Conference of the American Evaluation Association. Cleveland, OH. Contact: AEA, www.eval.org.

2019

- May 8-11 Congress of the European Association of Work and Organizational Psychology. Turin, Italy. Contact: EAWOP, <http://eawop2019.org/>

- March 20-23 Annual Conference of the Southeastern Psychological Association.
Jacksonville, FL. Contact: SEPA, www.sepaonline.com. (CE credit offered.)
- April 4-6 Annual Conference of the Society for Industrial and Organizational Psychology.
Fort Washington, MD (Washington, DC area). Contact: SIOP, www.siop.org.
(CE credit offered.)
- April 4-8 Annual Convention, National Council on Measurement in Education. Toronto,
ON, Canada. Contact: NCME, <http://www.ncme.org/ncme/NCME/>
- April 5-9 Annual Convention, American Educational Research Association. Toronto, ON,
Canada. Contact: AERA, www.aera.net.
- August 8-11 Annual Convention of the American Psychological Association. San Chicago, IL.
Contact: APA, www.apa.org (CE credit offered.)
- August 9-13 Annual Meeting of the Academy of Management (AoM). Boston, MA. Contact:
AoM, <http://aom.org/>.
- Oct 28-Nov 2 Annual Conference of the Human Factors and Ergonomics Society.
Seattle, WA. Contact: The Human Factors and Ergonomics Society,
www.hfes.org. (CE credit offered.)

IOTAs

David L. Tomczak
George Washington University

Honors and Awards

Alan Colquitt published *Next Generation Performance Management: The Triumph of Science Over Myth and Superstition*.

Morrie Mullins received the Bishop Fenwick Teacher of the Year Award at Xavier University.

Psychology and Work, by **Donald M. Truxillo**, **Talya N. Bauer**, and **Berrin Erdogan**, is a winner of the 2018 Textbook & Academic Authors Association's Most Promising New Textbook Award.

Dave Winsborough published *Fusion: The Psychology of Teams*.

Transitions, New Affiliations, Appointments

Charles Calderwood was named assistant professor of Industrial and Organizational Psychology in the Department of Psychology, part of the Virginia Tech College of Science.

Lisa Nishii was promoted to Vice Provost for Undergraduate Education at Cornell University.

Good luck and congratulations! Keep your colleagues at SIOP up to date. Send items for IOTAs to **Tara Behrend** at behrend@gwu.edu.